AATISH SINGH

TOURISM AT NUCLEAR POWER PLANTS
EDUCATIONAL PATHWAYS

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Eglė Gerulaitienė and Natalija Mažeikienė

Energy Tourism at Nuclear Power Plants: Between Educational Mission and Retention of "Safety Myth"

Abstract: This chapter has two principal objectives: first, to conceptualize the recent development in energy tourism by giving special attention to nuclear tourism as a distinct form of energy tourism and illuminating the educational potential of nuclear tourism sites and tours. Second, the chapter provides an explorative field research study of nuclear energy tourism in Scotland and Lithuania. The case study is based on field trips and observations conducted while visiting two energy tourism attractions – the Torness Nuclear Power Station and Ignalina Nuclear Power Plant (INPP) with Visitor Centres at these nuclear industry facilities. Features of nuclear tourism at atomic reactors and their premises are described in the chapter by pointing out the expansion of activities and target groups, going beyond the concept of expert-oriented tourism and moving to experience-oriented tourism, energy literacy, STEM education and orientation to wider groups of citizens and tourists (schoolchildren, families, etc.).

The authors of the chapter shed light on energy and nuclear tourism as an open and covert corporate branding and seek to shape positive attitudes of consumers and citizens towards the nuclear energy industry. The nuclear companies deploy tourism and educational activities (STEM education) to build citizens' perception of safety and security in the industry and strengthen pro-nuclear attitudes. Taking into consideration these aims of nuclear energy industry, a critical approach towards tourist attractions and educational sites at nuclear power plants has been employed by the authors.

Keywords: energy tourism, nuclear tourism, atomic tourism, nuclear power plants, Ignalina Nuclear Power Plant (INPP), Torness Nuclear Power Station

Introduction

Extensive development of energy tourism has expanded the interest of visitors to travel to different sites of tourist destinations (wind turbines, coal mills, nuclear power plants, etc.). Tourists want "to gaze at different landscapes and townscapes that are unusual for them" (Urry and Larsen, 2011). Therefore, such objects as giant cooling towers at nuclear power plants could be experienced as tempting and fascinating by tourists. Energy tourism overlaps with other types of tourism, including cultural and heritage tourism, as well as adventure

tourism and agricultural tourism. Nuclear tourism is continuing to expand and develop as a growing subset of the heritage tourism phenomenon, which has dramatically increased over the past several decades (Berger, 2006). Heritage tourism creates interest among visitors and provides enriching experiences. Extensive development of tourism is closely associated with a rise in the education demand for tourism activities. Energy tourism has the potential to improve people's energy literacy and change their behaviour in using energy towards more sustainable "energy citizenship" (Devine-Wright, 2007).

As energy tourism contributes to science and STEM education; promotes environment education; fosters the development of responsible citizenship, knowledge of heritage and history; the authors analyse the educational mission (potential) at energy sites and atomic reactors. Recently, there has been a growing debate that in addition to the educational potential and satisfying professional or learning interests, energy tourism must be classified as experience-based tourism, where tourists are invited to experience special feelings. The authors also discuss the influence of new public relations and corporate branding strategies, which have been introduced by energy companies and interest groups in order to influence public opinion about certain types of energy and energy companies. Energy companies seek to represent themselves as socially responsible and environmentally aware producers (Frantál & Urbánková, 2017). The topic of "safety myth" as a pro-nuclear narrative, created by the nuclear industry establishments together with governments, is criticized in this chapter.

The purpose of the chapter is to reveal the educational potential, which is envisaged in the existing nuclear tourism sites and tours. This chapter has two principal objectives: first, to conceptualize the wider interrelationships between energy and tourism, provide a definition of energy tourism as a new niche of special interest tourism; second, to provide an explorative field research study of nuclear energy tourism destinations in Scotland and Lithuania.

Methodology

The case studies presented in this chapter are based on field trips and qualitative observation conducted by visiting two energy and nuclear tourism attractions – excursions to the Torness nuclear power plant (Scotland, JK) and Ignalina Nuclear Power Plant (INPP) (Lithuania). Additionally, researchers conducted visits to Information/Visitor Centres at these nuclear sites (INPP and Torness) and analysed the content of these exhibitions. The researchers participated in two-hour tours inside the nuclear power plants and at Visitor/

Information centres. Additionally, these tours included conversations with guides working at INPP and Torness information centres about the narrative content of the excursions, which they provide for different tourist groups, and the topics and questions that interest visitors during the excursions. These two field research trips were arranged in 2019, the sites of nuclear tourism were explored from the perspective of a potential visitor. At the same time, experiences gained by the researchers and the content of the exhibits were interpreted by referring to theoretical considerations on energy and atomic/nuclear tourism, the role and functions of Visitor Centres at the atomic energy facilities and in relation to the concepts of publicity and openness, security and safety, and entertainment and education at the nuclear and atomic sites.

Both nuclear power plants offer two separate excursions for the visitors: one tour inside the nuclear power plants include a visit to three zones – the Reactor, the Control Panel and the Turbine Zone (from 1.5 to 2.5 hrs.); the other excursion – in the Visitor/Information Centres (from 1 to 2 hrs.), providing information on nuclear energy situation, safety, political/economic situation of the energy production and educational material.

Conceptualizing Nuclear Tourism as a Specific Form of Energy and Industrial Tourism

Nuclear tourism is viewed as a specific segment of energy and industrial tourism, which is characterized by the attractiveness of industrial sites in the country, new technologies and power plants (Otgaar, 2012; Frantál and R. Urbánková, 2017). Industrial tourism includes visits both to former, retired or regenerated sites (industrial heritage tourism) and to still operational industrial sites where some facilities have been provided specifically for tourists' use, even though the core activity of the site is not oriented towards tourism (Frew, 2008; Otgaar, 2012).

Energy tourism and its specific form – nuclear tourism – takes its shape at the junction of several types of tourism – industrial, special interest, expert-oriented, experience-oriented, cultural and heritage, adventure, farm and agricultural tourism (see Fig. 1).

What attracts visitors to operating energy production sites? On the whole, energy and nuclear tourism can be assigned to *special interest tourism* and expert-oriented tourism when certain groups (experts in energy, engineers, regional managers, students of technical universities, schoolchildren, etc.) have specific professional and educational interest in the subject related to their activities at work, in education and studies. Thus, in terms of the educational

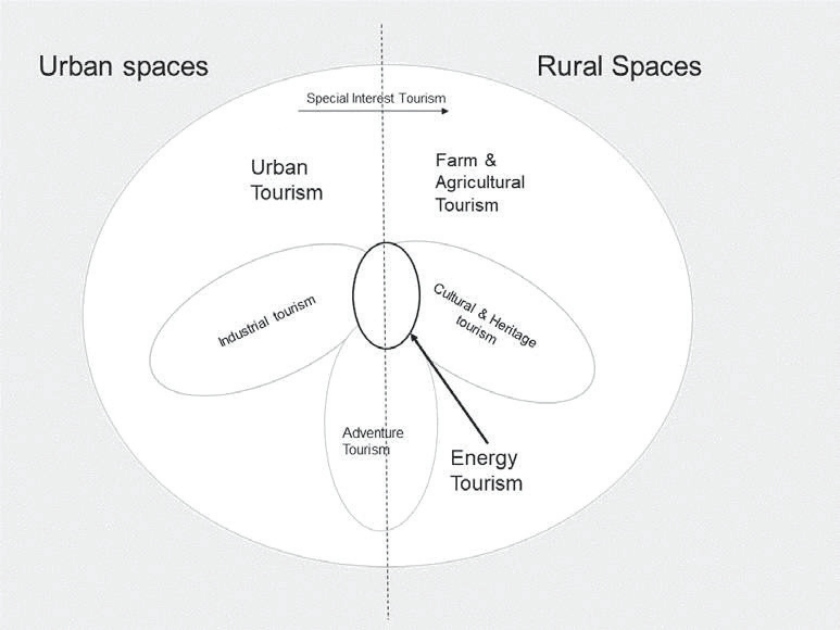

Fig. 1: Interrelationships of energy tourism and other types of special interest tourism (adapted from Frew & Shaw, 1995) by Frantál & Urbánková (2017)

impact, it should be emphasized that energy tourism (including nuclear tourism) has the potential to improve people's "energy literacy", improve the understanding of how we consume energy, and raise awareness of nuclear waste repository or potential impacts of nuclear activities on local economies (Frantál & Urbánková, 2017).

Promoting STEM education at energy sites and atomic reactors. Energy tourism contributes to science and STEM education, promotes environment education, fosters the development of responsible citizenship, knowledge of heritage and history. Regarding nuclear power plants, a certain content of knowledge and experience is exposed here: the history and construction of power plants; the principles and technology of atomic energy production and related matters, such as nuclear safety and security; topics related to radioactive waste disposal; and environmental and landscape impacts. So, the educational impact of energy and nuclear tourism is obvious.

STEM education through informal learning and "out of classroom experiences" is encouraged at most levels of the educational system as a way of strengthening students' interest and motivation. Museum visits represent one type of such experience, and museums are investigated as a means for improving the scientific literacy of both students and adults (Henriksen and Jorde, 2001).

New forms of nuclear tourism – combining environmental education, the presentation of novel technologies, interactive popular science experiments and various outdoor activities – attract schools to organize educational visits to museums to provide understandable scientific information about different topics: atoms, radiation, ionizing radiation and health, reactors, robots, physics and much more. Nuclear Power Plants (NPP) Visitor/Information Centres organize school visits, which are supplementary to the physics and chemistry curriculum. As stated in the research by Henriksen and Jorde (2001) regarding school visits to museums, studies have shown that a museum visit, in combination with pre- or post-visit experiences in the classroom, may provide considerable improvement in learning outcomes for students.

Energy sites as experience-based tourist destinations. Recently, there has been a growing debate that in addition to educational potential and satisfying professional or learning interests, energy tourism must be classified as experience-based tourism, where tourists are invited to experience special feelings. There is a new tendency in the energy tourism sector to focus more on various target groups that do not have a specific professional and study interest in energy. Energy tourism seeks to attract experience-oriented tourists of all ages (including families), for whom not only education, experience and emotions, but also entertainment and leisure are important.

Industrial infrastructure and industrial landscapes in general, and energy industry sites in particular, present tourists with an extraordinary visual experience. Tourists get fascinated and intrigued by the spectacular sizes and unusual shapes of industrial sites. Energy sites become a tourist attraction as something very specific and different from the places where the tourists themselves live, and visitors want to gaze at different landscapes and townscapes that are unusual for them (Pasqualetti, 2012; Frantál & Urbánková, 2017; Urry & Larsen 2011).

Some traditional energy landscapes are perceived as visually or environmentally polluted; that is why they potentially discourage tourists from visiting them. On the other hand, because of the difference from the usual environment, industrial sites attract tourists.

Recently, new energy tourism destinations have also attracted tourists' interest by exposing power plants with renewable energy sources (wind farms, photovoltaic, geothermal, hydropower plants, etc.). These facilities attract tourists due to unique technical nature, design and movement (Beer et al., 2017). Tourists visiting renewable energy source power plants are fascinated by the unique visual aspects of such places. As the authors (Beer et al., 2017) state, the visitors' interest is mainly caused by curiosity and in some countries by the rarity of similar types of technologies. Tourists visiting renewable energy sources sites are described as environmentally concerned visitors.

Nuclear power plants are also becoming an experience-based tourism destination. These sites evoke special aesthetic unique feelings of impressiveness and grandeur. Giant cooling towers of nuclear power plants are associated with modern cathedrals (Hecht, 1997). People even organize wedding ceremonies with a nuclear plant as a backdrop, as in the case of Temelın power plant in the Czech Republic[1].

Other authors describing thrill and excitement felt by tourists at nuclear power plants distinguish a heightened experience of being in an authentic place loaded with potential dangers (Storm et al., 2019). However, it is important to emphasize that a sense of risk arises not only from the immediate experience at the atomic facility, but also from the appeal to the broader nuclear imaginary. These are conceptions and imagination of nuclear power, which is constructed by political discourse, literature, media, cinematography, art, education, etc. According to Storm et al. (2019), visitors' imagination is fuelled by a mix of ambivalent understandings when appealed, on the one hand, to scientific utopian visions of the 1940s and 1950s, and, on the other, to dystopian fears of radioactive catastrophes and contamination.

Visitors' fear is amplified by the non-sensory qualities of radiation: it cannot be seen, heard or smelled by human senses unaided (Ibid.). So, nuclear power plants construct a peculiar perception of risk and security in the excursions and expositions at the Visitor Centres – this is where a kind of "security theatre" is arranged to calibrate the concordance between, on the one hand, calculable risk and security and, on the other hand, perceived risk, and security (Schneier, 2003 cit. Storm et al., 2019). The security theatre evoking a perception of risk

1 V. Lukasova, *Cooling towers for a witness: Weddings by a nuclear power plant Temelin, Czech Republic*, 2011. Retrieved from https://veronikalukasova.wordpress.com/2011/10/04/cooling-towers-for-a-witness-weddings-by-a-nuclear-power-plant-temelin-czech-republic/

is articulated through the partially limited and also ritualized access, through security procedures and rituals. The enhanced perception of risk increases the attraction of nuclear places.

Another very specific energy tourism destination that evokes unusual feelings and experiences is dark and disaster tourism destinations (e.g. tours to the Chernobyl power plant accident area). Such objects attract more and more visitors every year since they are treated as mysterious places. Visiting such places evoke a particular existential feeling – sublime, which can be described as a mixture of ungraspable and unimaginable horror with pleasure and excitement. The sublime is "a mode of subjective experience, a broadly pleasurable sense stimulated by landscape, but combining terror and awe, which anticipates dark and thana-tourism as a leisure activity. The sublime combines fear in the face of the infinite or incomprehensible, with a transcendence of that fear" (Goatcher & Brunsden, 2011, p. 127–128)

A Shift from Special Interest Groups' Tourism to Attracting Families and Children to Nuclear Power Plants

As mentioned above, energy tourism is moving from special interest and expert-oriented tourism to experience-based tourism. At the same time, there is a shift from orientation towards energy experts to attracting families and children. Therefore, a new aim is raised to combine educational activities with recreation, entertainment and adventure. New forms of nuclear tourism – combining environmental education, the presentation of novel technologies, interactive popular science experiments and various outdoor activities – have been designed to attract not only those who are interested in energy technologies (i.e. expert energy tourism), but also family-oriented or adventure-seeking tourists (Frantál & Urbánková, 2017).

A similar trend emerging in a broader field – industrial and energy tourism – is observed. The characteristics of tourism are changing, moving from one main target group (experts, students, pupils) to wider target groups (families, individual tourists and groups looking for entertainment and adventure) (Jiricka et al., 2010).

When focusing on special interest groups (experts, students, school pupils), it is expected that this group of tourists visits energy facilities in larger groups (e.g. student classes); their visits take place during workdays; and it is a short stay lasting 1–2 days, independent from the weather. Their main interest is related to work, education, know-how transfer; and they are focused on the cognitive dimension, with aims to obtain factual and practical knowledge,

technological and scientific information on energy production facility (Ibid.). The special interest groups mostly attend energy sites and indoor activities (visits to reactors, Visitor Centres). The main format of tourist activities embraces guided tours, expert lectures, discussions and seminars. Cultural activities here are just an additional incentive.

Meanwhile, the new paradigm in energy tourism to focus on families and children and the wider audience implies that the main motive for visiting is an orientation towards experience and entertainment, leisure, recreation and informal learning (Jiricka et al., 2010). Just recently, energy companies have begun offering new event and experience-oriented tourism products to attract – separately from experts, enthusiasts, or businesses – additional segments of tourists, such as young people, families with children or seniors. These tourists visit energy sites and their surroundings during weekends and holidays, in small groups, and they combine outdoor and indoor activities. The duration of their stay could be shorter (weekend trips) or longer (combination with other tourism offers, camps). It is rather seasonal and depends on the weather. To meet the needs of this group of visitors, the infrastructure of all regions is used (hotels, restaurants, camps, adventure parks, culinary, sport and entertainment facilities). According to Jiricka et al. (2010), unlike the special interest groups, this type of tourist is focused on affective (feelings) and kinaesthetic (motor skills) dimension, "learning by doing and feeling". They prefer guided offers, self-discovery offers (e.g. interpretive energy trail, energy fun parks, exhibitions and holiday camps).

Energy Tourism as a Part of Corporate Branding. Creating a "Safety Myth" at the Visitor Centres of Nuclear Power Plants

All these declared and anticipated educational benefits of energy tourism (including nuclear tourism) are questioned, taking into consideration the strong intention of energy companies supporting and organizing this tourism to influence the public opinion about the use of certain types of energy and energy providers. The companies tend to show a certain energy sector and energy sources as safe and economically useful. They seek to represent themselves as socially responsible and environmentally aware producers (Frantál & Urbánková, 2017). So, the implementation of educational benefits is contested and challenged by the "hidden curriculum" (concealed content and message as a part of public relations and corporate branding strategies of energy companies).

The nuclear industry establishment, together with governments, has been criticized for creating pro-nuclear narratives and constructing the "safety myth".

In a broader cultural and political discourse, communication and public relations of the industry, nuclear energy is represented as safe and reliable (Onishi 2011; Simon, 2019). Visitor Centres at nuclear power plants became a powerful public relations tool and tourist attraction in persuading the public about the safety and necessity of nuclear power. Nuclear tourism at nuclear power plants (NPP) is aimed to influence public opinion and shape public policy in favour of the pro-nuclear agenda. Nuclear tourism has already become a usual public relations' strategy of the nuclear industry (Sumihara, 2003). Through broader public communication in media, tourist and educational activities at the sites of nuclear plants, the nuclear industry seeks to reduce doubts, fears and anxiety in the public consciousness about the nuclear industry (Ibid.). A similar evaluation of narratives produced by the nuclear industry is given by Storm et al. (2019) in the observation that danger and unsafety related to the nuclear energy are not mentioned and represented. Anxieties of citizens are minimized during their tourist visits at nuclear reactors, and their worries shrink down; the inherent risks are rationalized through entertaining exhibits, nuclear fear is assuaged, and nuclear anxieties are transformed into nuclear acceptance via *a visit* (Simon, 2019). Visitor Centres become "paradoxically both a kind of multimedia warning sign, a marker for the danger that indicates you are entering a monitored and demarcated zone of limited access, as well as a place of tourism that promotes nuclear power, a safe space to process your nuclear fears" (Ibid., p. 64).

Scholars exploring the development of the Visitor Centers in Japan before the Fukushima accident in 2011 (Sumihara, 2003) describe how nuclear industry companies promote communication with local residents and tourists seeking to shape a positive image of the industry, impose a perception of nuclear facilities as safe and secure. Usually, the narratives about nuclear energy stress that it is an important part of the general energy landscape of the country, and nuclear energy is "clean" energy, which can create a proper response to global warming. Economic aspects are highlighted by pointing out that the supply of energy is at a relatively low cost. At the same time, harm to human beings and human costs of possible accidents are not sufficiently underlined.

Visitor Centres at nuclear power plants in Japan have gone through dramatic changes since the last decades. Starting from the mid-80s, Visitors Centres have started to reach a diverse population (not only male experts and politicians), especially women and children. Visitor Centres became an important asset to bring a sense of safety to women in general, especially those with small children. It is considered important by the nuclear industry to familiarize people from childhood as future decision-makers with nuclear power plants (Sumihara,

2003, 2019). The Visitor Centres founded in the 1970s were generally small, low cost and humble-looking buildings. They were situated at the edge of the power plant premises, which were located in remote and inaccessible areas. The visitor centres developed since the mid-1980s were very high-budget projects with a distinguished aesthetic concept – these centres were established in large-scale, fancy-looking, flamboyant and luxurious, futuristic appearance buildings of modern architecture.

These new Visitor Centres seek to attract children and young people. Interiors of the Centres are usually colourful, expositions are equipped with high-tech media, participative and interactive machines and displays, games, 3-D installations, science theatre and show-like presentations, cartoons, animation films, etc. All these audio-visual representations, music and imagery not only provide information on nuclear reactors, but also create strong emotional feelings. As Sumihara (2003, 2019) points out, Visitor Centres at Japanese nuclear plants after the late 1980s began to operate as multifunctional recreational and entertainment facilities. Visitors get access to seaside and natural parks, camping sites, outdoor open grass spaces, field athletic facilities (baseball stadium, swimming pools, tennis courts, etc.), other cultural attractions (i.e. archaeological museums). Visitor Centres started to organize sport and entertainment events (classes, competitions, picnics, etc.) for the local community, to attract people of all generations, families and children. New Visitor Centres included stores selling local commercial products, crafts, food. So, Visitor Centres performed activities such as recreation and tourism, which had nothing to do with nuclear power plants.

Sumihara (2019), comparing the concept of Visitor Centres in Japan and the UK, observed differences in narratives about a nuclear power plant. During a visit to the Visitor Centre at Sellafied in 2002, the researcher found that the UK nuclear plant did not attempt to persuade visitors to adopt a pro-nuclear stance. The exhibition avoids a one-sided depiction of nuclear power.

A debate on opinions supporting and opposing nuclear power explains the advantages and disadvantages of nuclear energy, and offers to "weigh the risks" are presented. Visitors are also introduced to the anti-nuclear movement in the country. It can be assumed that the exposition itself and a more general public discourse on nuclear energy in the UK and other countries were influenced by the antinuclear movement. This narrative is very different from the uncritical construction of nuclear power in Japan before the Fukushima accident in March 2011. From the mid-1970s onwards, public support for nuclear power fell in the UK and the US, exacerbated by the Three Mile Island accident in the US in 1979. Since the 1980s, opposition to nuclear power has been greater

than support, both in the US and the UK. Similarly, in Sweden, the issue of risk related to nuclear power had begun to enter the public agenda (early 80s) (Storm et al., 2019). Public support for nuclear power was seriously damaged by the Chernobyl accident in 1986. The Chernobyl accident led to anti-nuclear energy movements and protests all over Europe and influenced governance to open the atomic industry to the broad public.

The history of the anti-nuclear movement in Europe defines the content of current communication in current visitor centres. N. Sumihara (2019) states that the myth of safety about nuclear power plants was destroyed by the Fukushima accident. Japan's Visitor Centres after 3/11 stress that their nuclear power plants have significantly improved safety measures, especially against earthquakes and tsunamis, and introduced new procedures of safety.

Nuclear Power Plants as Objects of Cultural and Historical Heritage

One more development in energy and nuclear tourism is the process of heritagization. Energy tourism presents power plants as objects of industrial heritage; that is why, the features of cultural and heritage tourism stand out here.

On the one hand, the process of heritagization process implies the process when nuclear power is displayed as an object of heritage value; on the other hand, it is presented as a promising and potent technology of the future (Storm et al., 2019). During the process of heritagization, many nuclear sites were featured as museum-like information centres which were constructed and managed by the nuclear industry. In Great Britain and France, nuclear energy facilities gained a specific cultural value since some nuclear power plants were designed by famous architects.

The narrative at these facilities is generally focused on technical descriptions. At the same time, these newly created atomic heritage objects appeal to a utopian narrative of future visions and promises of atomic power, scientific and technological achievements, and progress in the nuclear field. This heritagization process by the nuclear companies creates an image of a safe and secure industry and does not reveal the dangers and insecurities of nuclear power. As Storm et al. (2019) point out, the heritagization process promoted by the nuclear industry is rather optimistic and does not represent messages and narratives on danger and unsafety of the nuclear industry, disastrous consequences of nuclear accidents. Anti-nuclear narratives are represented in other areas that are independent of the nuclear industry – in museums, art exhibitions, and broader cultural and artistic discourse.

Heritagization process of atomic sites and the nuclear past started earlier in the military nuclear industry. Atomic museums, established in the early decades of the Cold War at America's nuclear weapons complexes have become popular tourist destinations and educational institutions in the USA (Molella, 2003). The museums underlined "technical aspects of atomic bomb development but virtually nothing about their actual uses and unimagined destructiveness" (Ibid., p. 211). Their mission has been to preserve and exhibit the memory of the atomic bomb development under the Manhattan Project, celebrate and preserve the atomic heritage of the American nation. These museums contextualized the Bomb within Cold War culture by presenting the life of ordinary nuclear workers, exhibiting popular media and music, clothing styles, toys, furniture, etc.

The process of heritagization through "heritage preservation" at museums, monuments and visitor centres could be considered as an expression of public relations arranged by nuclear industry in promoting the "safety myth" (Simon, 2019).

The opening up as a response to the pressure of anti-nuclear movement. The establishment of Visitor Centres in the USA and Europe is a broad movement throughout the nuclear industry to make the transition from the secrecy of the atomic industry to openness to the society, allowing the general public better understand nuclear energy generation. Opening up of nuclear plants for the public could be considered as a search for forms of transparency and openness to the public. It has been prompted as a result of pressure by the anti-nuclear movement and the public's demand to know more about what is going on in nuclear power plants. Excessive secrecy has been an integral part of the nuclear industry– starting from the American military atomic energy programme and becoming a part of the military industry during nuclear proliferation in the context of the Cold War (Palfrey, 1953, cited Schuck and Crowley-Buck, 2015). A unique feature of the Soviet defence-industry complex was its secret "closed cities" (Barber and Harrison, 2000). The civil use of nuclear energy was surrounded by secrecy too, especially in the early stages of nuclear development. The Chernobyl nuclear accident was named a monument to the secrecy and failings of the Cold War (Hetherington, 1997). The establishment of Information/Visitor Centres has become a powerful communication tool to realize the openness of the atomic industry; it has become an opportunity to introduce the public to how nuclear energy works, leaving as little secrecy as possible.

Visitors at nuclear power plants are allowed to have a look at what is happening in the nuclear power station; how operations of the plant are performed,

monitored and checked; and how equipment and structures are managed. Information/Visitor Centres provide information for their visitors concerning the history and development of the nuclear industry; achievements in the physical science; energy development view; nuclear industry; and the relevant infrastructure construction, radiation and the measures to be taken for the protection from radiation. Visitor Centres are usually equipped with exhibits, panels and interactive displays to provide visitors with scientific and technical information about atomic energy, explaining how nuclear energy is produced and how safety is ensured.

Education in STEM for school children is among the key activities of Information/Visitor Centres. As an example of STEM education, it could be referred to Dukovany and Temelin NPP, where tourists can find a Reactor core model and Reactor model which allows them to learn what happens inside the reactor in the course of operation. In the Information Centre of Dukovany, informal evaluation of pupils' knowledge in physics is performed through "Play", where the players (visitors/learners) are invited to connect and relate images (faces) of discoverers (scientists), their names and their discoveries. Education activities are provided through simulations on how electric energy is produced in NPPs. Cloud chamber is one of a few devices enabling the observation of radiation particle trajectories.

Most Information/Visitor Centres are drawing upon various initiatives to build up better communication with visitors, including local inhabitants. One pre-condition for the educational infrastructure to work within the leisure–vacation context is that it ought to have a fun-oriented conception. First-hand experiences and learning by doing are the most important communication tools. Family-oriented offers and holiday camps are important parts of this experience-oriented tourism.

Summarizing the features of nuclear tourism at atomic reactors and their premises, the expansion of activities and target groups is distinguished, going beyond the concept of expert-oriented tourism and moving to experience-oriented tourism, energy literacy, STEM education and orientation to wider groups of citizens and tourists (schoolchildren, families, etc.).

Like many other energy companies, nuclear power plants implement open and covert corporate branding policy and seek to shape positive attitudes of consumers and citizens towards the nuclear energy industry. The nuclear companies deploy tourism and educational activities (STEM education) to build citizens' and customers' perception of safety and reliability of the industry and strengthen pro-nuclear attitudes. Taking into consideration these aims of

nuclear energy industry, a critical approach should be applied while assessing tourist attractions and educational sites at nuclear power plants.

Torness Nuclear Power Station as an Educational Site and Energy Tourism Attraction

Torness is a nuclear power station – one of the eight in the UK owned and operated by EDF Energy. It is situated some 50 km east of Edinburgh, at Torness Point, near Dunbar, East Lothian, Scotland. Torness has two reactors (AGR Advanced Gas-cooled reactors), able to generate 1364 MWe electricity. The construction of Torness atomic power plant started in 1980, and it was commissioned in 1988. Torness construction faced a wide public opposition. In Scotland, direct action against nuclear power was held between 1978 and 1980 (Rudig, 1994). Antinuclear movement in Torness started in May 1978, when 4000 people from Dunbar occupied the Torness construction site. 400 groups and individuals signed the "Torness Declaration" which committed signatories to take "all non-violent steps necessary to prevent the construction of a nuclear power station at Torness" (Torness Alliance 1979, p. 4) Held in the summer of 1979, the poll found 90 % opposed to any nuclear development in the area, 8 % demanding further safety analysis and just 2 % in favour of proceeding. The Torness Alliance continued to attempt annual occupations of the site, but were neutralized by the police, so the campaign to 'Stop Torness' and the wider aim of bringing an end to nuclear power did fail (Welsh, 2001).

Torness is the last of the second generation nuclear power plants in the UK to continue working. According to the plans, Torness power plant will operate until 2030. EDF is one of the UKs largest energy providers. They generate low carbon power via nuclear, gas and coal power stations that are spread throughout the UK. EDF energy company is engaged in decommissioning and closing the old generation reactors; it also uses fossil fuel, and is oriented towards the renewable sources of energy (wind, solar, hydropower). EDF invests in building wind farms across the UK and is running a large fleet of low carbon nuclear power stations and a smaller fleet of coal and gas stations. EDF is investing in Nuclear New Build projects by building a new nuclear power station at Hinkley Point and are planning a second one at Sizewell.

The energy landscape is undergoing restructuring in the UK. The UK's electricity demands are currently met by a diverse energy mix – power generated in a number of ways: nuclear; fossil fuels like coal, gas and oil; and renewables like wind, solar and hydro. The UK needs new investment in energy infrastructure to replace old and polluting electricity generation sources and address climate

change challenges. Since 2010, 26 power stations have closed, which equates to 20 % of the UK's generation capacity. By 2030, a further 35 % of the existing generation capacity will close down. EDF committed to providing a clean, secure and reliable solution to the climate change problem; at the same time, nuclear power has still an important role to play. The planned decommissioning of all "Magnox" type reactors and many Advanced Gas Cooled Reactors (AGR) means that, without a new generation of power plants, the contribution of nuclear energy will be reduced to around 5 % or 6 % of the total electricity production (till 2030).

The fact that EDF company is involved in generating different kinds of energy – nuclear, solar, wind, fossil fuel – and the whole country's power economy is in the company's hands is highly stressed in the power plant's Visitor Centre exhibition, which describes the importance of various types of power: information about fossil fuels, solar, wind and nuclear power. The exhibition introduces the structure of the national energy economy, defining the different roles of energy types and stressing the idea of energy mix. Nuclear energy is presented as part of the energy economy, and its specificity is discussed in comparison with other types of energy. The visual material of the exhibition displays information that nuclear energy is the biggest low carbon power source in the UK, producing 21 % of the nation's electricity supply in 2017. It is pointed out that solar power works best in sunny countries, but solar power still contributed 4 % of the UK's renewable electricity in 2017, and its generation was up to 87 % in the previous year. Wind power generated just under half of the UK's renewable electricity, while burning "fossil fuels" – coal, gas and oil – produced half of the electricity. It is noted that all fossil fuels are rich in carbon, so burning them releases carbon dioxide into the atmosphere, which means they are major contributors to climate change.

The enterprise takes care of the citizens' education and communication. The Visitor Centre, established in 2013, informs visitors about nuclear technology, basic properties of radioactivity and protection against ionising radiation. The guides of the Visitor Centre offer free tours in the power plant (see Fig. 2). The Centre was recently awarded five stars by "Visit Scotland" for the service quality and the range of services. The Visitor Centre is involved in educational, energy literacy and career STEM activities; introduces and discusses the use and combination of different types of energy (wind, solar, hydro, non-carbon); and attention is also given to general energy literacy. The Visitor Centre at Torness power station, opened six years ago, welcomed its 30,000th visitor at the end of 2019. In addition to offering educational tours of the power station, the Visitor

Fig. 2: Torness Nuclear Power Plant and Visitor Center (Photographs by E.Gerulaitienė)

Centre also holds themed family events, fairy and safari trails, school Christmas Cracker week and Santa's grotto, attracting people from around the area.

The review of the activities at the Visitor Centre leads to a conclusion that it aims at educating citizens and encouraging them to be active in making decisions about economic issues both in personal households and the country's economy, preparing citizens to take part in discussions on energy consumption and energy-related decisions. The Visitor Centre cooperates with educational institutions, organizes Career Days. The Torness Visitor Centre employs eight persons, who guide tours in the power plant, participate in promotional and educational activities. The EDF company, owning Torness NPP and the Visitor Centre, has developed an interactive training platform for teachers and children. This educational platform is available for visitors and clients of other EDF enterprises (NPP) and Visitor Centres. The platform offers free school lesson plans and practical tasks, organizes meetings, demonstrates films, and presents games and other information. The Torness tour guide mentions that not only excursions are organized for tourists and schoolchildren in the power plant, but outreach trainings can also be arranged at schools. Thus, well-organized educational activities are part of the EDF energy enterprise policy. A policy of openness of NPP was adopted with the agreement of the authorities. Visits to nuclear power plants have been encouraged. Such openness to the public might be considered as the common situation that has developed in the country and in the world in order to overcome isolation and to unveil the secrecy of nuclear energy, which was characteristic since the beginning of the atomic industry, to reduce and alleviate resistance to nuclear energy, and to improve the general energy literacy. This is extremely important in the countries and regions

where anti-nuclear movement has been strong and anti-nuclear sentiment is quite obvious. The anti-nuclear movement resulted in changes of the information and communication policy of all NPPs. These events and processes have evidently influenced the public communication policy of EDF as well.

Visitors' participation in "security theatre" performance. A special exclusive component of tourism at the NPP is the visitor's feelings and experience. Nuclear tourism is considered experience-based tourism, where, on the one hand, a sense of security and the perception of visiting a place loaded with potential dangers are constructed (Storm et al. 2019), and on the other hand, one of the communication goals of nuclear energy companies is to show that this place is protected and at the same time safe since strict security procedures are applied. According to Schneier (2007), security is both a reality and a feeling. The reality of security is mathematical, based on the probability of different risks and the effectiveness of different countermeasures. But security is also a feeling, based on individual psychological reactions to both the risks and the countermeasures. And the two things are different: you can be secure even though you don't feel secure, and you can feel secure even though you are not really secure.

During an excursion to NPP, the visitor becomes a participant of "security theatre performance", consisting of theatrical screening procedures and security rituals, which are arranged to calibrate the concordance between, on the one hand, calculable risk and security and, on the other hand, perceived risk and security (Schneier, 2003 cit. Storm et al., 2019). It is these constructed feelings that become the key element in experience-based tourism at NPP.

Similarly, a tourist visiting the Torness nuclear power plant becomes not only a spectator of the "security theatre", but also its co-creator and co-participant. From the very first moment of communication with the Visitor Centre, the visitor understands that the excursion is taking place in an operating enterprise, where security requirements are of prime importance. Extreme security measures were introduced in all atomic power plants after 11 September 2001. Since then, security in organizing and conducting tours of nuclear power plants is strengthened.

To make the tourist understand that he/she is coming to an object which is a danger zone with an existing "security mode", before the visit (not later than a month before) he/she receives a list of questions and recommendations related to safety (a memorandum on personal protective equipment (PPE), a warning that personal belongings and equipment are not allowed in the NPP; that tourists need to inform about special needs (e.g., medicines) in advance; information that a security declaration form will need to be signed); and the

requirement to have a proof of identity. When registering one month before the tour by e-mail, the tourist sends the passport data, and a presentation on the power plant is sent to him/her him/her. The procedure for organizing the excursions is very clear and carefully planned: after the confirmation of admission to the tour, a concrete time is set for the tour and its duration is defined – 90 minutes.

The second stage of security assurance takes place upon the visitor's arrival at the Torness nuclear power plant at the appointed time, where the security check procedure is performed: the visitor's passport is checked, and oral instructions are given. All personal belongings, handbags, computers and other electronic gadgets are left in the locker of the Visitor Centre. Only a pen and note paper are allowed during the tour.

The visitor's participation in this procedure creates an experience for him/her – it evokes feelings, and there are various actions and procedures, giving rise to many thoughts and impressions. The visitors can only guess why they are not allowed to take the mentioned things with them. Upon the arrival at the Visitor Centre, prior to the tour, the visitor has to sign documents: pre-tour questions, asking to assess the tourist's preparation for the tour and to self-evaluate whether he/she will be able to spend 90 minutes walking through large premises, climbing stairs, moving up and down in lifts; asking if the visitor has medical problems. The next document is signing a confidentiality agreement. The instruction part is very important, as the handrail must be observed throughout the nuclear tour (this is reminded throughout the tour); visitors are informed that when they hear the alarm, they have to follow the guide; they cannot keep their hands in their pockets and wear high heels (so as not to fall). In the Visitor Centre building, an employee (guide) and security staff check the identity documents, and upon entering the NPP itself, a personal search is performed using a hand-held metal detector and/or an explosive gas detector. Similar procedures, according to Storm et al. (2019), could be described as "security theatre" that refers to security measures taken to counteract terrorism, such as scanning bodies and luggage at airports – measures that create and construct the experience of security. In that way, it is not real, but rather a "theatre" of improved safety. Thus, security theatre performance is widely practised in atomic power plants and has a "side effect" – a special experience is created for the tourist, and the sense of danger and risk is strengthened. All of these actions, including strict staff supervision and surveillance – stripping of items, walking on a separated pavement strip, along a high-barbed wire fence, a thorough physical inspection at the nuclear site itself with detectors, and passing through inspection and detention gates – give

the visitor a feeling that there are potential dangers in this place: on the one hand, a physical danger of falling, injury in a specific space; on the other hand – the physical tourist's inspection shows that someone may try to harm or cause danger to the operation and safety of the atomic power plant, to spy using electronic equipment (cameras, computers). These security measures and all the procedures indirectly create a sense of the hidden dangers of nuclear energy – radiation and its harm, which can be exploited by criminals (spies and terrorists), who need cameras, computers and explosives for carrying out their evil intentions. On the other hand, as stated by the authors analysing security theatre (Schneier, 2007, Storm et al., 2019), such exceptional attention to security is needed not only for the real security when visiting an atomic power plant, but for creating perceived security, for calibrating psychologically the real and perceived danger. However, real and perceived risks do not always coincide. Schneier argues that in some cases we tend to exaggerate risks, such that the security theatre may then help to adjust feelings and reactions to match the calculable level of threat. In other cases, the risks are greater and the security lower than we recognize; the reason for this might be traced to performances of a security theatre that is an expression of power abuse – that is, to actually disguise risks (Schneier, 2007). It is difficult to decide how in this concrete case real danger and risk are calibrated with the security theatre performance played for the visitors, and the authors of this chapter could not claim that the performed risk procedures at the Tornes NPP exaggerate real risks; however, it can be said with great certainty and conviction that all these actions and rituals really create an exciting experience for the visitor and it is an important part of nuclear tourism. The tourist begins to realize the exceptional importance of the object itself, the dangers that lie here (the danger of radiation and the potential crimes (terrorist attacks) that are prevented here). These safety rituals at nuclear power plants are exceptional, unknown to many people, unusual and in this sense exotic, thus creating completely new long-lasting experiences and feelings for the tourist.

The excursion in the nuclear power plant premises, after passing through the inspection post, proceeds in the controlled power plant area: reactor hall, engine/turbine hall, and unit control panel. The tour takes place in an operating enterprise, so there are certain rules that are observed by the guide. The guide takes visitors along the intended path-route. While moving along the corridors and looking round the premises and halls, the tour participants meet and see the company employees, who move among units and perform work tasks. The only staff member who the tourists can contact directly is the guide. This is foreseen and regulated in the memos and is followed during the tour itself as

a physical-communicative pattern so that the visitors cannot move wherever they want and initiate contacts with the employees. A tour in this enterprise is a tightly controlled, supervised action, when the trajectory of the visitor's movement around various planned areas, contacts (communication) are quite strictly guided, supervised and surveilled. The movement of the visitors' group is supervised – the guide opens and closes the door, visitors are invited to follow her/him along the corridors, and they take the lift with the guide, who constantly explains and shows by hand where to go and how to go (repeatedly reminding to hold on to the handrail). This physical and communicative guidance and supervision are also part of the security theatre performance, creating a distinctive unusual experience that is undoubtedly an integral part of this tourist destination attractiveness. The whole course of the tour, when the visitor feels controlled, directed and guided, at the same time monitored and followed, enhances the tourist's sense and perception that he/she is in a place where strict security requirements are taken while protecting something, and the tourist himself/herself is, on the one hand, protected against injuries, on the other hand, is considered a potential source of danger, the one who can cause harm (because of which all the personal belongings were taken away, personal and passport data were checked, documents against collecting and disseminating information about the company were signed, talks with the staff were forbidden). All this constitutes a perhaps completely incomprehensible experience for the tourist himself.

When walking along the corridors of the power plant, the guide tells the visitors by demonstrating the visual educational materials on the walls, about the history of the atomic power plant, the construction, posters to commemorate the start and finish of the construction, dates, educational material about the gas cooled reactor type, etc. A separate topic is storing of the used fuel, transfer to Sellafield for reprocessing and recycling into new fuel.

In the reactor hall, in order to better acquaint the visitors with the principles of the reactor's operation, there is a glass room from which a view of the huge spacious reactor hall opens from above. This room also features training material, reactor parts and an explanatory text on the reactor design, commented by the guide. Next to the control panel room, there is also a large glass window, through which visitors are allowed to observe the technological processes taking place there, i.e., computers, buttons and the complex monitoring of the nuclear power plant. The tour lasts approx. 1.5 hours. However, visitors have an opportunity to ask additional questions, which are not part of the standard planned narration. Therefore, depending on the visitors' education, interests and activity, the story can be easily expanded and guides willingly provide

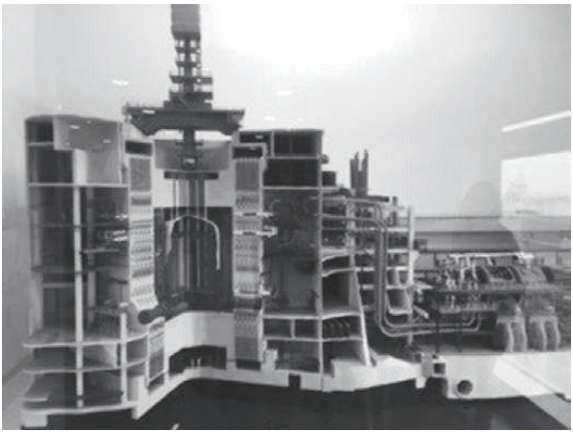

Fig. 3: Interactive exhibition in the Visitor Centre (Photographs by E.Gerulaitienė)

additional commentaries, direct towards other topics. For example, the authors of this chapter initiated a discussion with the guide about the technical factors that caused the Fukushima disaster, how technological processes are arranged in the Tornes reactor and how disaster prevention mechanisms work. The guide explained the differences between the technological processes in Tornes and Fukushima in detail. It is important to mention that talk about accidents in nuclear power plants is not a usual part of a tour narrative; however, when it is initiated by tourists, guides are ready for a competent discussion.

Educational Mission at the Torness Visitor Centre. The Visitor Centre is not large, and it covers about 80 sq. m. It is divided into educational spaces (desks, chairs, information about atomic energy and the atom, interactive game screens, etc.). The Visitor Centre contains a lot of stand information about the reactor, how it functions, how energy is generated and how much of it is produced at the Torness atomic power station. Great attention is given to the description of how the power plant safety as well as the removal and storage of used fuel are ensured. There is also a full stand with handouts, information material on used reactors, renewable energy, used waste management and storage, etc. (see Fig. 3).

Lectures and demonstrations about nuclear technology and radiation protection are intended primarily for school students. Occasionally the visitors are pupils from lower grades of primary school and even kindergarten children. For these children, lectures about power plant operation and nuclear technology

Fig. 4: Interactive displays and exhibits to familiarize visitors with nuclear energy

are appropriately adjusted according to the level of their knowledge. Therefore, various interactive displays and demonstrations are held in the Visitor Centre (see Fig. 4).

The Visitor Centre can boast of a very interesting educational exhibit/experiment: measuring the radiation level by selecting which material is most likely to inhibit the spread of radiation. The photo shows two overlapping wheels, the blue one of which contains various radioactive materials (dinosaur bones, uranium glass, granite, welding rods, etc.), while the orange wheel contains materials that block the action of radiation as a shield (wood, clothing, glass, aluminum, lead). The radiation level is shown at the top (see Fig. 5).

Another interesting exhibit demonstrates the operation of the advanced gas-cooled reactor (AGR) and how much electricity the electric reactor can generate at what capacity. The process is demonstrated quite simply: on the left side there is a hand which regulates the reactor capacity, then the process of generating electricity starts. To the right are houses with light bulbs that turn on when electricity is started; if the reactor power is pressed low, then one or two houses turn on the lights, while if the reactor is started at full capacity, then electricity appears in all the houses, thus allowing the visitor to understand how much

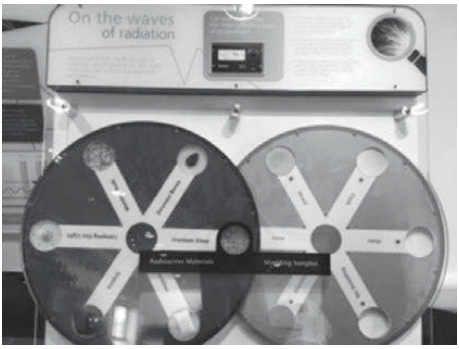

Fig. 5: Interactive educational exhibit – measurement of radiation level

energy is needed to have electricity in the house. This exhibit is meant for younger children who enjoy physical interactive activities. At the same time, the operation of energy is demonstrated here, when the energy power generated by the reactor transmits electricity to households.

One of the topics at the Visitor Centre presented for target groups is management and storage of used fuel. The sequence of the whole process of managing used fuel is introduced.

Another significant educational environment is the **virtual online space**. The Internet website https://www.edfenergy.com/energy/education contains educational films about how energy is generated, safety issues are discussed and the future of energy industry is described. Altogether, five films are offered. By using virtual reality and CGI animation, the visitor is suggested to trace the journey of an atom to the core of a nuclear reactor. The films show how nuclear fission happens inside power stations and how the energy is then used as steam to turn turbines – producing electricity for people's homes.

The Pod is an award-winning school programme, launched back in September 2008, and has since become the largest programme that lays a particular focus on energy, waste and biodiversity, and also covers a range of other environmental topics. The Pod presents topics on energy, waste transport, biodiversity and climate change. The emphasis on learning through science, technology, engineering and mathematics is provided in www.jointhepod.org – an interactive website for teachers, community group leaders and children. All of the resources are curriculum linked, free and are aimed at 4–16 year olds. The Pod provides lesson plans, practical activities, assemblies, films, games and information packs, as well as posters, stickers and badges. The analysis of the

materials on the Pod platform highlights the main topics: energy information pack, which describes energy use, energy mix, global energy mix, UK's current energy mix, energy demand; minimising the effects of climate change; reducing our demand for energy; energy sources; advantages and disadvantages of different types of energy production; curriculum links; plastic waste information pack; and history of food packaging timeline. Each topic encloses a separate information pack with theoretical and practical tasks and games.

Another interesting communication and education trend at the EDF is attracting and retaining female talent to the energy industry. The programme aims to spark the imagination of 11–16-year-old girls, encouraging them to pursue STEM subjects at school and in their careers. This programme is called "Pretty Curious" and aims to inspire teenage girls to imagine a future where they use STEM – science, technology, engineering and maths – to help make a difference (https://www.edfenergy.com/prettycurious). The platform also includes the STEM career quiz, which can be tried by any child. The quiz game shows whether the child is interested in science, technology, engineering or maths.

In summary, the Torness Visitor Centre performs an educational mission to educate the public, especially school-age youth, not only by providing them with knowledge about nuclear energy and its production, safety, technological solutions, future renewable energy resources in connection with formal education, but also by allowing them to experiment, to touch, to experience very closely and practically how energy is produced, to simulate processes, to take a close look at the grandiosity and complexity of a nuclear power plant that was hidden from society for many years. The Visitor Centre carries out educational, energy literacy and career STEM activities; presents and discusses the use and combination of different types of energy (wind, solar, hydro, without coal), with a focus on and care of general energy literacy. The Visitor Centre also promotes and develops citizens' involvement, political participation and energy literacy.

Ignalina Nuclear Power Plant: Exploring Education and Tourist Facilities at the Enterprise Under Decommissioning

In 1974, preparatory work for the construction of INPP began. At that time, the most powerful NPP in the world, INPP, was built not only to meet the needs of Lithuania, but also those of the integrated North-West energy system of the former Soviet Union. In 1974, the INNP atom city-power plant satellite monoindustrial town Sniečkus (present Visaginas) was founded. The first reactor unit was put into operation in 1983. The second unit started operating in 1987. After the Chernobyl accident, the construction of the third unit of the

INPP was preserved, and in 1989 stopped completely. After the restoration of Lithuania's independence in 1991, the INPP became an important part of the country's energy system. In 1993, the INPP produced about 88 % of the electric power needed by the state. Following the Chernobyl accident, a number of detailed investigations and safety assessments were carried out at INPP, and additional safety measures were introduced. However, the operational risk of RBMK-type reactors could not be reduced to the level that would be safe enough to operate for a long time. The first unit of INPP was shut down in 2004, the second in 2009. An important political aspect of the closure of the INNP was that it was the condition of Lithuania's accession to the EU.

After Lithuania closed its nuclear power plant, gas and oil, which are imported energy sources, accounted for the largest share of energy consumption. Lithuania has inherited technologically inefficient and resource-guzzling centralized energy sector, long time relying on Russia's natural resources. After the closure of the INPP in 2009 and finally terminating the operation of the nuclear energy, Lithuania focuses more on expansion of renewable resources of energy, green energy. Production of bio-fuel, bio-mass, bio-gas and wind energy is being developed. In 2020, Lithuania will produce 35 % of the needed electrical energy from renewable resources.

According to Lithuania's National energy independence strategy (2018), the strategic directions of the Lithuanian energy sector will be followed by implementing the outlined objectives: the breakthrough – more electricity produced in Lithuania than imported – should take place in 2030, when electricity import will decrease twice and Lithuania will produce 70 % of the necessary electricity. By 2050, complete energy independence from imported energy resources will be ensured – all consumed electricity (100 %) should be generated in Lithuania (see Tab. 1).

In INPP, two water-graphite nuclear reactors RBMK-1500 operated. These were the most powerful energy reactors in the world. The thermal capacity of one unit was 4800 MW, the energetic capacity – 1500 MW. After the accident in Chernobyl NPP, the capacity of the RBMK-1500 reactors was reduced and they were allowed to operate only with a maximum thermal capacity of 4,200 MW. In INPP, as in all power plants with RBMK reactors, a single-circuit thermal scheme was used: saturated 6.5 MPa pressure steam supplied to the turbines was generated simply by boiling light water circulating through the reactor in a closed circuit. The power plant had only two power units. Each power unit had premises for nuclear fuel transportation systems and control panels. Common to both power units were the engine hall, rooms for gas cleaning and water treatment systems.

Tab. 1: The strategic directions of the Lithuanian energy sector (Lithuania National energy independence strategy, 2018)

2020 **Energy Security**	**2030** **Competetive Energy Market**	**2050** **Energy Sustainability and Independence**
Objectives 1. Integration of the energy system in the EU energy system 2. Improvement of efficiency of energy consumption 3.Balanced and sustainable RES development 4. Optimisation and modernisation of energy infrastructure	**Objectives** 1. Energy price in the industry sector will be the lowest in the region (compared to other (Baltic, Scandinavian and Central and Eastern European countries); for citizens – a decreasing share of energy expenditure compared to average income 2. Smooth transition from fossil-based energy sources to RES	**Objectives** 1. 80 % of the country's energy needs is generated from non-polluting (zero emissions of GHG and air pollutants) sources 2. 100 % of local electricity production in the country's gross electricity consumption

According to the data of 1 January 2019, Ignalina Nuclear Power Plant had 1901 employees, of which 985 employees were Russians, 314 – Lithuanians, 195 – Belarusians, a similar number of Poles and Ukranians (https://www.iae.lt/apie-imone/statistika/62). This specific demographic composition of the company's employees reflects the circumstances of how nuclear energy was developed in Lithuania in the 1970s. Workers, engineers and nuclear energy specialists from other nuclear power plants in the Soviet Union were sent to build and work at the enterprise. The current Lithuanian city of Visaginas (INPP satellite) also has a very specific demographic profile, with about 18 % of the population (according to 2011 data) belonging to the titular nation (Lithuanians), the main part of the population being Russians, Belarusians, Poles, Ukrainians and others. The Russian language in this city is the lingua franca, next to Lithuanian as the state language. In 2018, this city had a population of about 18 thousand, over 30 nationalities.

Interest in excursions at the INPP has grown significantly since May 2019, after the premiere of the HBO series Chernobyl. INPP received huge attention from tourists, as the series, which became popular, was filmed here. In total,

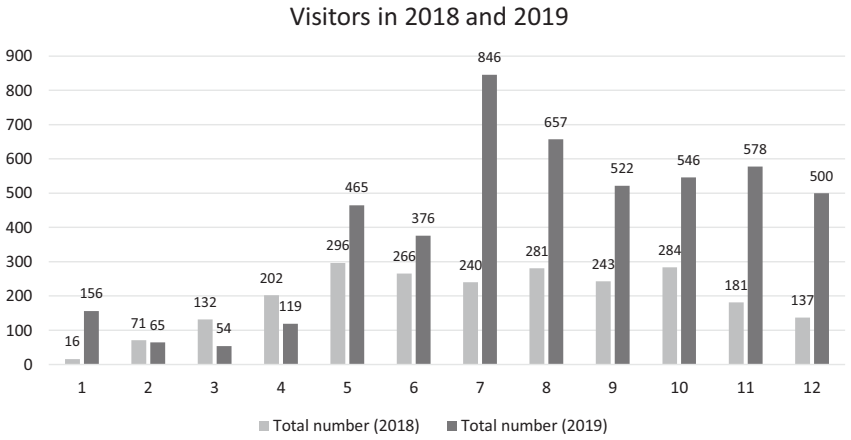

Fig. 6: Statistics of INPP visitors in 2018–2019 (based on data by INPP Communication Unit)

in 2019, almost 5 thousand people visited INPP from Lithuania and foreign countries, and about 500 excursions were organized (See Fig. 6). For comparison, in 2018, INPP organized 240 excursions (which is twice less), comprising over 2 thousand people. During the excursions in the controlled INPP territory, visitors have a unique opportunity to visit the reactor hall, the turbine hall currently in the process of dismantling, and the unit control panel room. Excursions are organized for both individuals and groups of visitors interested in the history of the INPP the principle of operation, decommissioning work, radioactive waste management, radiation safety requirements, etc. Since the opening of the INPP Information Centre in 1995, about 100 thousand visitors from around the world have taken part in the excursions.

The organization of excursions in INPP reflects the goals of public communication carried out by nuclear power plants around the world – to inform the general public about the safe work of the enterprise. Prior to the closure of the nuclear power plant as a part of the energy industry, the excursions served the purpose of realizing the idea of openness to the public, demonstrating operational safety, and carrying out STEM education. In the context of the INPP decommissioning mission, the main content of the communication includes a message on the safe and efficient implementation of decommissioning of the nuclear power plant with RBMK-type reactors, safe and reliable management of radioactive waste. The INPP communication on decommissioning declares that

the project under implementation has no analogues, and Lithuania is the first country in the world to dismantle an RBMK-type reactor and related systems after the unloading of spent nuclear fuel. The society's support and information about the work being done and planned is a significant part of this process.

Visit to Ignalina NPP Closed Territory – "Security Theatre" and the *Masquerade*

The excursion after the checkpoint takes place in the controlled (closed) territory of the INPP: reactor hall, engine room, unit control panel. The tour lasts approximately 2.5 hours. The excursion, unlike in Torness NPP, is paid – the cost of organizing the excursion per person is about 60 Eur. Actually, the fee does not apply to companies controlling INPP activities, members of the Seimas and Government of the Republic of Lithuania, official delegations, journalists, representatives of educational institutions, students, public and non-governmental organizations and other persons visiting INPP on official visits. Excursions are organized for groups of up to 15 people on weekdays. Due to the increased interest in the object after the release of the series Chernobyl in 2019, INPP organizes two excursions per day. Participation is prohibited for persons under 18 years of age and pregnant women. Before arriving at INPP, a memorandum is sent to INPP visitors about prohibited items and general internal rules, which state that the INPP nuclear power facilities are equipped with a physical security system. Safety is ensured by armed security officers. The territory is monitored by video cameras, and videos are made. Access to the territory of INPP facilities is possible with permits issued by INPP. Persons, vehicles, transported objects and cargo are inspected at the control point.

When entering the main administrative building, tourists have to wait for a guide; they are not allowed to take photos, videos or use the Internet in the building itself. It should be noted that most of the guides are people working in the INPP Communication Department, but when there is a high flow of visitors, INPP employees from different departments lead the tours. Upon arrival of the guide, a permit to enter the territory is issued at the box, but before that, visitors must present passports or personal ID. Before passing the inspection, the issued permit must be attached to the outer garments at the chest level so that it is clearly visible. Visitors may enter the premises and be in the territory of different objects only if they are accompanied by a designated person. The visitor is informed that if he/she loses the permit, he/she must immediately inform the accompanying person. Before passing the control room, it is mandatory to remove metal items from the pockets and place all the possessions on the

conveyor of the baggage control X-ray machine. Personal belongings and items for which a permit has not been given to take them to the INPP site may be left in the lockers.

Visitors must comply with all legal requirements of the accompanying person, employees of the INPP Physical Security Organization Service and officers of the Security Unit. When visiting INPP, passing through security posts takes quite a long time because each visitor scans his/her permit, enters the code, then passes through the metal rotating turnstile and waits for others to perform the same action. The equipment (camera) owned by the guides, who are INPP employees, is also checked. There are signs on the doors of the building prohibiting photography, filming and even using the Internet. After meeting at the Permit Office, the participants and the guide – (INPP employee) are issued permits. Before that, the visitors could put their belongings in lockers for storing things, because computers, equipment and cameras cannot be carried inside.

After passing through security detectors (similar to the airport), the guide informs that all employees have their own movement routes within the INPP territory, i.e., not everyone is allowed to move around the whole area; usually the staff, depending on the specifics of his/her work, get a designed route they can move along. The person is not allowed to enter the zones outside the movement route because no permit has been granted. The tour guide must also withdraw a permission to lead the participants along the established trajectory in the enterprise.

One of the greatest impressions of the tour for the visitors is the application of physical safety measures – to avoid taking radioactivity and contamination outside the controlled area. The participants of the tour change their clothes, putting on special clothing, the same as that worn by all the employees of this company inside the company. This procedure is specific at RBMK reactors: since there is no container over the reactor, or protection layer, radioactivity is more dispersed in the controlled area and the worker's or visitor's own clothes could be contaminated during a longer contact with the body. That is why there is a requirement to change the clothes before entering and leaving the INPP. So, the visit to the controlled area of the RBMK reactor can be considered more risky than in reactors of other types. White professional clothing at RMBK reactors and in the Soviet atomic industry can illustrate the symbolic connection with science culture – nuclear physicists were using white robes for protection purposes. Additionally, white robes and uniforms are a widespread symbol depicting scientists working in laboratories and medical doctors working in hospitals. This association of white robes and uniforms of the Soviet

nuclear industry staff with medical doctors has been noted while analysing the iconography of the Chernobyl accident. "On Soviet TV, the workers in the front lines of the clean-up at the Chernobyl nuclear plant all wear white cloth caps, white mouth guards and white uniforms. They look eerily like surgeons operating with bulldozers and precast concrete blocks instead of scalpels and surgical thread" (Barringer,1986).

Thus, visitors at the INPP continue to participate in the "safety theatre" performance by adding a new attraction – dressing, which becomes a kind of carnival or masquerade. Radiation measurement and control procedures on potential radioactive contamination give tourists a sense of thrill experiences, health and life risks, which is a valuable experience for this type of tourism. On the other hand, the fact that it takes place as part of tourism creates a sense of safety..

After the security checkpoint, the visitors are taken to the "Sanitary Sweeper", i.e., the changing rooms for the staff. Visitors take off their clothes and put on white underwear pants and a white shirt. Then they pick up beige socks and tuck the pants into the socks. Then, wearing blue rubber slippers, they go to another room where they put on top white clothes – pants and a jacket, pick up white shoes from the closet (similar to medical staff hospital clogs, but with closed heels) of each size, put on a white hat, a helmet and tie hair with rubber bands; the visitors are explained that this is done so that their hair does not absorb radioactive substances (see Fig. 6). At the end, they put on white gloves. Each visitor receives a dosimeter that they put in their pocket. The dosimeter shows how the radiation level, measured by the dosimeter, has changed during the tour.

The tourist route in the NPP includes a visit to three zones: Reactor zone, Control panel and Turbine zone. The move towards the starting point – the Reactor area – makes a big impression, as it goes primarily through the glass transit corridors. The guide also stops in the corridors and tells about the specificity of INPP: it consists of 6 generators for 1 unit. During the tour, in which the author of this chapter Eglė Gerulaitienė participated (see Fig. 7), the story of the INPP was linked to the well-known nuclear accidents in Fukushima and Chernobyl. The guide commented on the low probability of an accident at INPP compared to the Fukushima accident, pointing to certain technical details (INPP generators are 25 m above ground level, while in Fukushima it was underground). A lot of attention was given to the Chernobyl theme, mostly about filming the HBO series at this enterprise. The guide commented on where certain scenes in the series were filmed. It was noted that during the filming, the filming team faced the challenge of participating in all security procedures,

Fig. 7: Excursion in Ignalina Nuclear Power plant: EDUATOM project researchers Ilona Tandezegolskienė and Eglė Gerulaitienė

when both the filming team members and all filming equipment and props had to be thoroughly inspected according to the usual security protocols here.

During the tour, visitors walked along long, dimly lit stuffy corridors, climbed stairs to the sixth floor. Upon entering the Reactor area, visitors had to put disposable bags on their shoes. Before entering this zone, there was an apparatus for measuring how much the hands and feet were contaminated. The green colour would indicate that they were clean, uncontaminated, yellow colour would show that the hand or foot were more contaminated, and the red colour would indicate high contamination. When standing in the reactor area, the visitors are greatly impressed by the size of the room and the height of the ceiling. Visitors are explained about the removal and replacement of fuel cartridges, about special safety measures (during the operation, removal of the cartridges used to take place at night, when it was unlikely that many people would be injured in case of an accident).

In summary, a visit to the nuclear power plant makes a really strong impression, enhanced by the ritual of changing clothes, safety assurance rituals, and long dark corridors along which the visitors walk for two hours.

Exploring Narratives of INPP at Information Centre

The INPP Information Centre introduces tourists to information about the former most powerful INPP in the world. The centre is located in a separate

building, which is not subject to any inspection procedures. Visitors register for a tour of this centre in advance. The exposition includes several rooms (one larger and two smaller rooms). Guides provide information about INPP, its history, construction, operating principles, safety and decommissioning, waste storage and atom functions; but very often visitors also ask additional questions, are interested in economic issues, e.g., what is the cost of decommissioning, what is most expensive and what is the share of the EU. The Information Centre is meant for various visiting groups, from schoolchildren (physics, biology teachers with pupils), students from various universities (especially engineering and technology profile) and families, to representatives of public authorities, politicians and energy experts, who are interested in decommissioning and financing.

At the beginning, a 10-minute educational film is demonstrated in Lithuanian or English. The guide tells about how the nuclear power plant works, what is uranium, and the technical capabilities of the RBMK 1500 (high power reactor, channel reactor) work. A total 17 such reactors have been built around the world.

The INPP Information Centre has a working model of the INPP unit, a model of fuel assembly, a model of a spent nuclear fuel storage container CASTOR and models of short-lived radioactive waste storage or disposal of low and medium radioactivity to be built. During the tour, a live view of the INPP interior – the reactor room, the turbine hall and the spent fuel storage hall – can be observed on the TV screen. Video films about INPP and other educational films about radioactive radiation (in Lithuanian or Russian) can be shown upon request.

Throughout the tour, visitors are shown and explained in detail how the dismantling takes place, how the technical management of radioactive waste procedures takes place.

The Information Centre also mentions the Chernobyl accident, as this power plant's reactor is the same as it was in Chernobyl (RBMK 1500), explaining to visitors the reasons associated with the power experiment at the Chernobyl power plant at that time.

As the Information Centre focuses on narration and communication about the decommissioning of the power plant, it is natural that most of the narrative is devoted to telling about various dismantling work, discussing radioactive waste management mechanisms and financial aspects (see Fig. 8).

It should be noted that the educational material in the INPP Information Centre is oriented towards senior gymnasium classes, technology students or specialists who work and are interested in the field of nuclear energy – the history of the nuclear power plant, the principle of operation, safety and

Fig. 8: INPP Information Centre

decommissioning. It can be assumed that the presented visual material, posters with educational information and layouts are sufficiently complex and incomprehensible for younger school-age children. Besides, there are no interactive educational solutions here that visiting students could try, feel and understand.

To sum up, four topics can be identified, which are reflected in the Torness and Ignalina Information Centres and nuclear power plants (see Fig. 9):

Energy Literacy. This topic is reflected through presenting general knowledge about energy as an economic branch at the country's macro level, i.e., tourists gain knowledge about the energy sector, how energy is produced in the country, how nuclear energy contributes to the country's economy, what is the role of nuclear energy, and how environmental issues, CO2, energetic and technological parameters arise. Visitors learn the story about the nuclear power plant in the context of the nationwide energy, e.g., how many NPPs there are, how many are obsolete, what happens to the decommissioned NPPs, and what are the related economic processes, environmental, waste disposal and technological aspects.

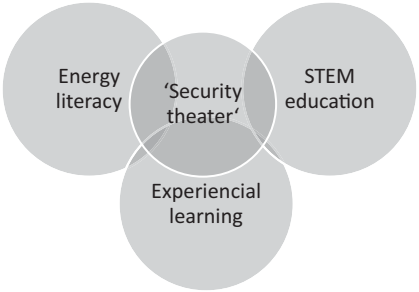

Fig. 9: Topics reflected in Torness and Ignalina Information Centres and Nuclear Power Plants

STEM Education. The topic is reflected in the analysis of the technological aspects of a nuclear reactor. Various information is provided about the reactor, a nuclear power plant as an aggregate in the territory of which different technological processes take place, e.g., in the reactor hall, engine room, unit control panel (which combines information about the atom, gas, turbines, rods, graphite, the whole Mendeleev table). All this includes various sciences – physics, chemistry, technologies, engineering and mathematics.

Experiencial learning is the third very clearly observed aspect in both power plants and their Information Centres. It is related not only to the ability to focus on kinaesthetic (motor skills) dimensions, where "learning by doing and feeling" or first-hand experience is involved in the learning process, but most importantly – affective (feelings) or common phenomenological sensation, because visiting nuclear power plants disclose their greatness, security, organization and control. The very complexity of the nuclear power generation process opens up; tourists see lots of buttons, wires, turbines, mechanisms large and small; and guides try to explain it all in simple words that will help at least bring the tourist closer through experiential learning to greater knowledge.

"**Security Theatre"** performance – an important element in enhancing the impression for nuclear power plant visitors. As mentioned before, security is both a reality and a feeling. A member of an excursion to NPP becomes a participant of "security theatre performance", consisting of a theatrical checking procedure and safety ensurance rituals, which are arranged to calibrate the concordance between, on the one hand, calculable risk and security and, on the other hand, perceived risk and security (Schneier, 2003 cit. Storm

et al., 2019). When visiting the Torness NPP, the tourist becomes not only a spectator of the "security theatre", but also its co-creator and co-participant. Safety requirements are extremely important both in the active Torness Nuclear Power Station and in INPP under closure.

Conclusions

Turning a nuclear power plant into a tourist attraction goes in line with the main aims of public communication of nuclear energy companies – to open nuclear energy generation facilities to citizens; to "spread the veil of mystery" and remove the secrecy; to acquaint with the principles of operation of a nuclear power plant, technical aspects of ensuring safety; and to conduct STEM education and develop energy literacy. At the same time, through tourism, nuclear industry companies also accomplish corporate branding to shape positive pro-nuclear public opinion about nuclear energy. The aim is to create an image of the nuclear industry as safe and reliable.

Both Torness Nuclear Power Station and INPP are undergoing the process of heritagization of the atomic industry. The expositions of Visitor and Information Centres present the history of the nuclear industry and the companies and tell how these power plants were built. The story about the construction of the satellite city Visaginas occupies an important part in the INPP exposition. It is discussed and presented in the expositions how nuclear energy played an important role in the general industrial history of the country and in the period of 1980–2000.

Today, the Visitor/Information Centres carry out an educational mission to educate the public, especially school-age youth, by providing them not only with knowledge about nuclear energy and its production, safety and technological solutions, but also about future renewable energy sources. At the same time, nuclear companies seek to provide an opportunity to visitors and learners to see from a very close range the grandeur and technical complexity of a nuclear power plant.

The Torness NPP exhibition aims to develop schoolchildren's energy literacy by presenting information and knowledge about nuclear energy together with the role and importance of renewable energy sources in the further development of the country's economy and the important impact on sustainability.

After analysing the expositions of INPP and Torness NPP, it can be seen that they aim at presenting technological processes to the public, showing how safely and reliably nuclear power generation processes are carried out here, and safety is ensured. Torness NPP is an operating company producing energy, so the aim

is to show through nuclear tourism that the processes are smoothly organized and controlled. The content of the exposition of the INPP Communication Information Centre and the excursion inside the company create a narrative about the safety of decommissioning processes, professionalism and high reliability of the work performed.

In the excursions of both analysed NPPs, facts about failures (Chernobyl, Fukushima accidents) are only partially included. Stories about these accidents are presented to reassure visitors that the technological processes and safety are significantly different from those at the Chernobyl and Fukushima power plants, and therefore, similar accidents cannot occur here. This topic about nuclear accidents is of great interest to visitors, who ask questions and initiate discussions. It should be noted that in both power plants the topics concerning non-safety of nuclear energy are not initiated by the companies themselves. The analysis of these two tourist destinations reveals the features of the atomic industry narrative, identified by Storm et al. (2019) that messages on danger and unsafety of the nuclear industry are usually not presented in the expositions.

The main communication message of the INPP is to tell about the safety of the decommissioning and waste management procedures. However, the challenges and problems of waste management are not extensively presented to the visitors. In the exposition of the Information Centre, one of the last exhibits mentions the general problem of nuclear waste, noting that the decay of nuclear elements has been going on for hundreds and even thousands of years. Yet, the real and topical technological and environmental waste management problems faced by the company and the nuclear industry as a whole are not raised or discussed. The story of Chernobyl in the current INPP tours appeared due to the interest generated by the HBO series Chernobyl. The staff of the nuclear power plant included this topic in the story of their tour after the premiere of the series. However, the tour guides focus more on filming the series on the INPP site than on INPP's links with the Chernobyl nuclear power plant, both of which operated the RMBK reactor with an inherent design unsafety.

INPP communication in the exposition and excursion of the Information Centre follows the line that despite the unsafety of the RMBK reactor, all necessary improvements were made at the INPP power plant after the Chernobyl accident, a new incident was prevented, and INPP was closed due to political decision, when the EU politicians raised the issue of closure as a condition for Lithuania's accession to the EU. This narrative is widely developed by the company itself, as well as by the public media, in political discourse, and formal education content (textbooks).

After analysing the excursions of the two power plants, it becomes clear that in addition to the common goals of nuclear tourism (development of energy literacy and STEM, corporate branding of energy companies, development of a narrative on nuclear safety and reliability), this aspect of tourism becomes more evident: it becomes experience-based tourism, creating an exceptional and striking visitor experience. Being in these facilities, visitors have a unique opportunity to admire the grandeur of the objects in this industry and the complexity of the nuclear power generation process – visitors view a lot of buttons, wires, turbines, large and small mechanisms. Visitors feel the grandeur when looking around, spotting huge production halls and seeing enormous-size aggregates.

A separate memorable experience for visitors is participation in security screening and assurance procedures, what researchers (Schneier, 2008, Storm et al., 2019) called security theatre, described earlier in this chapter as security theatre performance. Visitors experience special feelings that allow them to understand what the nuclear power is, what the invisible risks and dangers associated with radiation are, and thus indirectly understand and feel how safety procedures seek to prevent harm to human health and the environment. This part of tourism becomes the most important part for the person who visits the nuclear area itself, causing affective (feelings) or common sensations. Participation in security screening procedures and rituals creates a sense and understanding of security, management and control. The function of the Visitor Centre is usually ancillary and secondary to the main excursion inside the power plant.

Torness Visitor Centre, compared to INPP Information Centre, lays greater focus on affective (feelings) and kinaesthetic (motor skills) dimensions "learning by doing and feeling", first-hand experience, touching interactive displays and playing simulated energy games.

Tornes Visitor Centre exposition demonstrates transition from expert-based tourism, where the main target groups are experts and students, to attracting other groups of tourists and visitors. Torness Nuclear power station offers educational tours and holds themed family events, fairy and safari trails, school Christmas Cracker week and Santa's grotto, attracting people from around the area. Integration of additional attractions and entertainment takes place, thus expanding target groups, involving families.

It must be acknowledged that the communication and education of these power plants with old-generation reactors goes in line with the general contraction and declining role of this industry. Lithuania has closed its nuclear power industry, Scotland is undergoing a major restructuring of its energy industry

to reduce the share of nuclear power by closing old reactors and investing in renewables.

However, the development of STEM skills and energy literacy at the Visitor/Information Centres demonstrate the educational potential of power and nuclear tourism. At the Torness Nuclear Power Station Visitor Centre, the staff are actively working with the local community, with local and regional schools organizing events, and the exhibition itself demonstrates an orientation towards younger children. Despite the decline in total nuclear energy in the UK, Tornes NPP is part of the EDF company, which supplies all types of electricity and operates the energy sector, has an interest in building a positive reputation and brand, in forming positive attitudes of young people towards the enterprise generating electricity, in developing general energy literacy and ensuring the training of specialists by contributing to the joint STEM training in the region and the country.

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Linara Dovydaitytė

The Pedagogy of Dissonant Heritage: Soviet Industry in Museums and Textbooks

Abstract: This chapter examines how Soviet industry is remembered and studied in both formal and informal education in post-Soviet Lithuania. Industrialization of the country coincided with and was forced by Soviet occupation (1940–1990), and the legacy of this industrialization is explored using a concept of "dissonant heritage". The central focus of this chapter is the in-depth interrogation of five museum displays and twenty history textbooks covering the period of high industrialization in Soviet Lithuania. Content analysis and ethnographical study of these pedagogical sources reveals that there are quite different and even competing narratives around Soviet industry. These range from celebratory stories of technological inventions and rapid growth of new industries to negative narratives about the Russification of the country and contamination of the land. While the image of industrialization as a Soviet colonial project prevails, the work and life of industrial communities remains untold. The absence of working-class experiences not only creates a double dissonance in the heritagization of Soviet industry but also creates a gap between educational narratives and the live memory students encounter in the reality. In addition, the chapter reveals that nuclear energy plays a significant role in the narratives of Soviet industry as the nuclear theme introduces the importance of sensibilities such as nostalgia and fear, into the discourse of "dissonant heritage".

Keywords: Soviet industry, nuclear energy, heritage, museum, textbook, Lithuania

Introduction

The initial idea for the chapter emanated from an observation of growing academic, cultural and artistic interest in the Ignalina Nuclear Power Plant (INPP) and its satellite town Visaginas (formely Sniečkus), situated in North Eastern Lithuania.[1] The INPP was built in the territory of Soviet Lithuania between 1975 and 1987, and housed two largest Reaktor bolshoy moshchnosty

1 Since the early 2000s the INPP and its satellite town has been an object of numerous international research projects not only in nuclear sciences but also humanities and social sciences, including history, architecture and social anthropology. The scholars are mosly interested in the INPP as an example of Soviet nuclear industry while Visaginas has drawn attention to it as a (post)socialist mono-industrial town. For references see: Freimane, 2016b; Stepanov, 2018. Among many other artistic and

kanalny (RBMK) reactors in the world. Engineered as an ambitious nuclear energy project of the Soviet empire, the INPP was attacked by environmental and national activists following the Chernobyl disaster in 1986.[2] After gaining independence in 1990, Lithuania decided to close its only nuclear power plant in order to meet the conditions of entry to the European Union, beginning the decommissioning in 2004[3]. Together with the closure of the plant, the thirty-year history of Visaginas as an atomic town came to an end. It seems that the end of the nuclear era in Lithuania motivated the need to begin the heritagization of this quintessential technology and industry of modernity. Yet the process of turning the past into heritage only starts here, and it is complicated.

It is complicated for at least two reasons: firstly, various groups of society relate differently to the INPP and the history of Visaginas. For the nuclear engineers and the majority of the population of Visaginas, predominantly Russian-speaking immigrants from the entire former Soviet Union, that place, represent both the progressive project of modernity and its collapse. For the environmental activists and the majority of the population of Lithuania, the INPP is associated with Soviet occupation – for most Westerners, with an insecure nuclear power station in the East. Yet Storm claims that none of these groups consider the INPP as "their own" heritage.[4] After having investigated the INPP in 2010 and included it in an international comparative study, Storm states that "still the Ignalina is activated in neither local nor international context as a means for memory work and future orientation" (2014, p. 95).

Secondly, in post-Soviet Lithuania, the complicated relationship with the past is conditioned not only by the particularities of the INPP as a Soviet nuclear project, but also by a wider range of issues related to the Soviet industrial heritage in general. Until World War Two, Lithuania was essentially an agricultural country. Industrialization began here at the end of the 1950s and became the most important economic and social phenomenon (Misiunas & Taagepera, 1993, p. 183). The Soviet Union, which prized the geopolitical situation of Lithuania, invested huge resources in the country's infrastructure. In

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cultural events the INPP was presented in the Baltic Pavilion at the 15th Venice Biennale of Architecture in 2016.

2 The INPP has the same reactor type as used in Chernobyl.

3 Two reactors were put into operation in 1983 and 1987 and were closed in 2004 and 2009, respectively.

4 According to Storm the nuclear community is the most obvious group who could claim Ignalina as their heritage. But she suggests that there is a grief rather than a conscious heritage process that takes place here (2014, pp. 94–97).

Soviet Lithuania, the development of new branches of industry was initiated; new factories and industrial complexes were built resulting in an escalation of rapid urban growth;[5] and industry, and, later, services surpassed agricultural employment.[6] Industrialization altered the social structure of the society and thus introduced the modern lifestyle and urban culture.[7] Therefore, the period of high industry in Lithuania means both Soviet occupation of, and radical change in the society, which subsequently turned away from rural and agricultural towards urbanization and industrialization.

Yet when Lithuania regained independence in 1990, the legacy of Soviet industry did not become heritage. On the one hand, with the change in the political system and the transition from planned socialism to "wild" capitalism, many branches of industry collapsed, factories went bankrupt, and industrial workers lost jobs and had to modify their qualification. Under the circumstances of the swift historical and political changes, nobody was interested in the collapsed industry. On the other hand, there was no place for narratives, experiences and memories of Soviet modernization, urbanization and economic welfare in the post-Soviet politics of memory. The dominant discourse presented the Soviet period as one of loss and trauma (Nikžentaitis, 2013); a negative assessment of the entire period (Safronovas, 2009), the narratives of the perpetrator and the victim, repression and opposition prevailed. According to Drėmaitė, popular consciousness, which identifies national identity with the rural past, associates the heritage of Soviet industry, primarily understood as "alien", with pollution, a Russian immigrant workforce and poor quality of products: "Industrialization is a Soviet legacy, thus it is not ours" (2012, p. 72).

Since the beginning of the 2000s, the concept of Soviet heritage began expanding and became more varied in Lithuania. Historiography started covering topics related to the life and culture of the society during the late Soviet period alongside the previously dominating political themes of Soviet

5 In 1950, 28 % of the Lithuanian population lived in the cities; in 1970, they made up 50 %; and in 1989, 68 % (Meškauskas, 1994, p. 253).

6 In 1970 industrial and construction employment surpassed agricultural employment. In 1980–85 industrial and construction employment peaked with around 40 % of total population, and services became the major sector of growing employment (Meškauskas, 1994, p. 260).

7 A modern family consisting of two people became commonplace, an urban youth culture formed, the forms of spending leisure time changed with the spread of television and cars, with the rise of living standards, consumerism became a dominant force, etc. (Misiunas & Taagepera, 1993, pp. 218–227).

repressions and opposition to the regime; diverse interpretations of the heroic period – the anti-Soviet guerrilla war – emerged. Museums and exhibitions began displaying fragments of Soviet industry, modern lifestyle and urban everyday life.[8] The history of the everyday, including the Soviet period, was incorporated into school textbooks dominated previously by the narrative about politics and economy (Bitautas, 2018). Such a change allows us to ask – what is considered to be the Soviet industrial heritage in contemporary Lithuania, how is it interpreted and for what purpose is it created?

The goal of this chapter is to provide a wider context for the heritagization of the nuclear industry in Ignalina by investigating how Soviet industry, including the nuclear industry, is remembered and how people can learn about it in Lithuania today. Two types of pedagogical sources have been chosen for analysis: museum displays and history textbooks. Pedagogy in this text is broadly conceived as a learning process taking place both at the institutions of formal educational and in the realm of broader culture. The latter is defined as "public pedagogy", which covers various forms and sites of education, including informal educational institutions (i.e. museums), popular culture (i.e. movies), dominant discourses (i.e. public policy) and social activism (i.e. grassroots movements) (Sandlin et al., 2011).

In accordance with critical pedagogy and culture studies, pedagogy is understood both as a practical and a political activity. It is associated not with the transfer of knowledge, but with the formation of experience and subjectivity: "When one practices pedagogy one acts with the intent of creating experiences that will organize and disorganize a variety of understandings of our natural and social world in particular ways" (Giroux & Simon, 1988, p. 12). In this sense, pedagogy is understood as a set of practices, inside or outside of schools, that "organizes a view of, and specifies particular versions of what knowledge is of most worth, in what direction we should desire, what it means to know something, and how we might construct representations of ourselves, others, and our physical and social environment" (Giroux & Simon, 1988, p. 12). Thus, both school textbooks and museum displays may act pedagogically

8 In the open-air museum in Grūtas Park, which was established in 2001 and soon became very popular, not only the remnants of Soviet culture are exhibited, but also the "banal socialism" is turned into heritage. For example, the experiences and memories of Soviet everyday life are revived through Soviet dishes in the Grūtas café (Lankauskas, 2006). The Energy and Technology Museum opened in the defunct Vilnius Electric Plant in 2003 presents the history of Lithuanian technology allocating a very important place to Soviet industry.

through the production of narratives and the creation of experiences that make us think about the past in some ways rather than others.

This chapter analyses five museum displays and temporary exhibitions, and twenty history textbooks recount Soviet industry. Among several science and technology museums open in Lithuania today, I have selected those that are clearly concerned with the industry of the Soviet period, including the nuclear industry. All currently approved[9] 5th, 10th and 12th grades' history textbooks covering the history of Lithuania of the second half of the 20th century have been analysed.[10] Two interrelated layers of museum displays and textbooks have been examined by using the method of content analysis: the semantic layer that comprises the thematic choices of the museum and textbook discourses; and the layer of material, visual and linguistic realization of the semantics. In other words, according to the general theory of semiology, the question is not only what is being said, but also how it is said.[11] Analysis of the museum exhibitions is accompanied by specially conducted interviews with museum workers and study of secondary sources (museum documents, websites, etc.). The main purpose of the research is to find out how Soviet industry is narrated in contemporary museums and school textbooks. The main focus of this study is not only the associations with the past whether negative or positive, condemning or sympathetic, created by the narrative, but also a more complex question inseparable from the study of heritage: what and whose histories are told by the

9 The textbooks approved by the Ministry of Education, Science and Sport of the Republic of Lithuania, valid for the academic year 2018–2019, are published in the database of textbooks and other school supplies supervised by the Education Supply Centre of the Ministry of Education, Science and Sport of the Republic of Lithuania: https://www.emokykla.lt/bendrasis/vadoveliai The database also includes several editions of the same textbook. If the new edition of the textbook completely repeats the contents of the old edition, only the new version of the textbook is used in this study. If the new edition contains significant changes, not necessarily in the text, but also in visual material, both editions are analyzed.

10 According to The General Curriculum Framework for Basic Education (2008) and The General Curriculum Framework for Secondary Education (2011), history is taught at Lithuanian schools in three concentric circles. The material of the first circle is taught in the 5th and 6th grade, the second, in the 7th–10th grades, the third, in the 11th and 12th grade history programme. This way the 50 years Soviet period (1940–1990) is studied in the 5th, 10th and 12th grade in Lithuania, starting with general introductory and going over to more complex questions.

11 For more on the semiological interpretation of museums see Ravelli (2006), on analysis of textbooks see Klerides (2010).

heritage of Soviet industry in post-Soviet Lithuania? What role is played here by scientific discoveries, technological objects, industrial management and the life of industrial society? What narratives, memories and experiences of Soviet industry are available for the practices of pedagogy today?

A (Double) Dissonance in Industrial Heritage

It is worth discussing the issue of Soviet industrial heritage (including the nuclear industry in Ignalina) using the concept of dissonant heritage. In their acclaimed book on heritage management, Tunbridge and Ashworth argue that all heritage is inherently dissonant: discrepancy and incongruity is characteristic of any product of heritage (1996). This is related to the very definition of heritage. Heritage is a product not of the past, but of the present, consciously produced with regard to the needs of the present. Heritage is produced by selecting and interpreting the past, thus it always contains a certain message that, implicitly and explicitly, conveys certain values. Due to this selection and interpretation process, dissonance is not a simple byproduct of the production of heritage, but a constitutive part of that product. To illustrate this thought, Tunbridge and Ashworth point out that "all heritage is someone's heritage and therefore logically not someone else's: the original meaning of an inheritance implies the existence of disinheritance and by extension any creation of heritage from the past disinherits someone completely or partially, actively or potentially" (1996, p. 21). The heritage produced through selection and interpretation always represents historical experiences of specific social, ethnic, or religious groups and disinherits other groups whose "distinctive historical experiences may be discounted, marginalized, distorted or ignored" (Tunbridge & Ashworth, 1996, p. 29).

In the 1990s, soon after the restoration of Lithuania's independence, persons and their families who had suffered from the occupation regime became the principal group which inherited the Soviet past. The Lithuanian Union of Political Prisoners and Deportees representing them initiated the main museum in Lithuania dedicated to the Soviet past: the Museum of Occupations and Freedom Fights (founded in 1992, it was titled the Museum of Genocide Victims until 2018). The community of former prisoners and deportees have founded in total around 40 museums and expositions in Lithuania, which, like the main museum, also present the Soviet period through the narrative of terror and resistance (Rindzevičiūtė, 2015). The social group that was clearly dispossessed of the Soviet past was the former working class. During the late Soviet period industrial and construction workers constituted a considerable

portion of the society making up around 40 % of the total population in the early 1980s. Yet, considering the fact that the Soviet period is a period of occupation, one should not oppose those groups to each other. On the contrary, the membership of both groups – former prisoners/deportees and former workers – partially overlaps. Thus, in this case, we can state that in post-Soviet Lithuania, the former working class turned part of Soviet legacy into heritage (traumatic and heroic historical experiences), and the other part of legacy (historical experiences of work and everyday life) have remained the past, partially history, but have not become heritage. And a portion of the former working class, which consists of Russian-speaking immigrants[12] or persons that have not suffered from the regime,[13] have become disinherited from the Soviet past.

Considering the heritagization of Soviet industry in post-Soviet Lithuania, one could speak about a double dissonance by which I mean that former industrial communities have been doubly disinherited from both the Soviet past and the Soviet industry.[14] On the one hand, after the historical turning point in 1990, the (former) industrial communities did not claim the heritage of Soviet industry as their own (Drėmaitė, 2012) and were disinherited. On the other hand, the issue of social class alone causes dissonance in production of industrial heritage (Tunbridge & Ashworth, 1996). Having referenced industrial museums of Western countries, especially Britain, as an example, Tunbridge and Ashworth state that the main disagreement lies in the question: which and whose stories are being told by former factories and industrial sites. Class dissonance is the most important element when one decides which narrative about the industrial past to choose: that of the technical progress or of the history of work, that of free enterprise or of capitalist exploitation, that of the elite or of the working class (Tunbridge & Ashworth, 1996, p. 78). Class dissonance defining capitalist industry may be relevant also to Soviet industry, which was formed in reality by the ruling class of the Communist Party (or the nomenclature) and

12 Immigration to Soviet Lithuania where Lithuanians constituted about 80 % of the population was negligible.

13 For example, those who owned little land in pre-war Lithuania and for whom Soviet occupation brought greater economic welfare and social stability.

14 By double dissonance I mean that in the case of Soviet industrial heritage former working class is doubly disinherited: 1. The main inheritors of the Soviet past are those who suffered but not benefited from Soviet regime (workers got jobs, flats and social insurance so we can say they benefited from the system) 2. The main inheritors of Soviet industry tend to be Soviet ruling class and central government but not industrial workers which I try to show in the text afterwards.

the lower working class.[15] Thus, the question which and whose stories should be told by Soviet factories and industrial sites that are being converted into museums or texts about former industries is open and problematic.

Industrial Heritage: What and Whose Stories?

In Western countries, the heritagization of modern industry started in the 1960s and 1970s as a consequence of and reaction to the end of the industrial era that lasted for 200 years.[16] After the collapse of various industries, many factories and industrial sites were closed, demolished or left to decay. At the same time, academics and history amateurs started collecting, preserving and exhibiting industrial heritage, at first in Great Britain and later in other countries. Today industrial heritage is considered to be part of cultural heritage: it is defined by the various legal documents of international organizations, it is included in the lists of values to be protected, some countries treat industry as a symbol of their national identity (Vargas-Sánchez, 2015), and industrial tourism is considered to be an important factor in local regeneration processes (Hospers, 2002).

The most important international guidance document passed by The International Committee for the Conservation of the Industrial Heritage (TICCIH)[17] gives the following definition:

> Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education (2003).

15 The opposition of Soviet colonialism could match another division characteristic to the imperialist capitalist industry of "provincially/colonially ruling classes or the exploitation of peripheral/subject populations": the central power in Moscow or the workforce of the occupied countries.

16 Although the notion of "technical heritage" was used in Soviet Lithuania the heritagization of modern industry did not take a place here. In the late 1960s and 1970s, when Western countries already faced industrial crisis, the Soviets experienced the culmination of industrialization and felt no need to preserve it (Drėmaitė, 2012).

17 TICCIH has been ICOMOS's specialist adviser on industrial heritage since 2000 and assesses industrial sites for the World Heritage List.

This universally accepted document relates industry to all areas of life – from science and economics to everyday work and life. From the beginning, however, in the practice of industrial heritage there is an ongoing debate around its principal subject: the history of technology and business or social history of work (Storm, 2014).

In the 1990s, while critically analysing the growing number of industrial museums, Fitzgerald distinguished three widespread ways of showing industrial heritage: the "internalist style", the "celebratory style" and the "social and cultural historical style" exhibitions (1996). The internalist style is characteristic to the oldest displays of science and technologies that present industry through showcasing technical objects. Machines – steam turbines or locomotives – are exhibited as works of art: intrinsically grand, beautiful and valuable. This style of exhibiting separates industry from the history of hard work, from the wider social and cultural context. The celebratory style exhibitions relate technological objects to people's stories, but only those of a certain group – industrialists and engineers, and not the stories of workers. Furthermore, they present industry uncritically as a constant technological progress, thus "the worst celebratory style exhibitions are guilty of propaganda" (Fitzgerald, 1996, p. 119). Internalist and celebratory exhibitions conceal complexities, ambiguities and controversies, which are characteristic to any industrial heritage (Cossons, 2012). Those displays remind rather of temples where science and technology are worshipped (Fitzgerald, 1996).

The third, the newest, type of exhibitions links modern technologies to their use and impact on people's lives. The social and cultural historical style exhibitions focus on the way technologies have affected different social groups, including workers. Those exhibitions use more varied sources; alongside technological objects and documents, they utilize personal testimonies and memories. Yet Fitzgerald points out that focus on the social and cultural impact of technologies does not necessarily make this type of exhibition more analytical and critical. He quotes *The Great Railway Show* at the National Railway Museum as an example which paid much attention to the travelling habits of the British royal family but told nothing about railway accidents or railway workers' strikes (1996, p. 124).

Davies adds to this debate by discussing the presentation of work and communities related to that work at museums and heritage sites. She claims that the debate over what is more important – technological equipment or workers' activities – does not exhaust the subject of work. Any work, industrial activity in this case, creates an entire social and cultural phenomenon: "Work has many socio-political by-products and is not simply a process of performing a

particular task" (1996, p. 114). Industrial work creates industrial communities, which are characterized by a social and cultural lifestyle defined by their work activities, but not limited to them (for instance, football as an important part of the life and identity of an industrial community). Today the social and cultural historical style exhibitions seek to present an exhaustive image of industrial community life by recounting narratives of work, education, leisure, the everyday and the lifestyle in and around factories and industrial sites.

The aforementioned typology of industrial exhibitions helps us to understand the diversity of ways to show industrial heritage, but in practice those three different types often coexist in one exhibition or heritage project. A good example of the latter are industrial museums and heritage sites making up the Route of Industrial Heritage in the Ruhr area in Germany. The history of local industry is told here in very different ways: from the Engine House in the Zollern colliery, which is presented as a modern temple of industry, to the half-celebratory, half critical display of industrialist life and activities in the former administrative building of the same colliery, to simple, mundane objects such as the half-full bowl of soup displayed as a rare specimen in the Ruhr museum which informs us about the peculiarities of daily life of an industrial worker's family.[18]

Industrial Heritage and Nostalgia

Like other kinds of heritage, industrial heritage is strongly related to the question of identity. Heritage, similarly to language or religion, functions as an identity marker. It is used "to construct narratives of inclusion and exclusion", which usually define a community by outlining its specific characteristics through the difference from another community (Graham & Howard, 2008, p. 5). Heritage is also used in order to support the continuity of identity. The narratives and representations of the past provide the feeling of continuity for the present society, relate the present to the past and simultaneously present the past as a finished stage and opens opportunities for the future. Thus, people's lives are localized in a "safe" linear narrative that links the past, the present

18 Through an ordinary bowl of soup Mrs Ritter from Kirchhellen tells a story that she could only half-fill the soup bowls as otherwise the soup would spill out over the side. This is only one of the effects on daily family life of the subsidence caused by mining in the building zone. For years one side of the house has been sinking by a little more than millimetre a year. This information is presented in accompanying label in the Ruhr Museum.

and the future. The past, "once translated into heritage", appears as the basis of identity, which provides "familiarity and guidance, enrichment and escape" (Graham & Howard, 2008, pp. 5–6).

Macdonald relates the movement of industrial heritage to the efforts to preserve and rethink the identity of a community in the changing world. As the need to preserve rural heritage emerged under the circumstances of industrialization, attention to the industrial past emerged during the period of de-industrialization, i.e., in the face of change and loss. By referring to the museums of everyday life, Macdonald argues that such means of heritage help to articulate local and communal identity, to salvage ways of life that have been vanishing and preserve a certain difference and independence while encountering changes (2013). While understanding that the efforts of communities to musealize everyday objects and everyday lives could mean simply a defensive or compensatory reaction upon encountering menacing social changes, she claims that these efforts are still worthy of academic analysis. From the anthropological point of view, "the emphasis on everyday things (and lives) is an ultimate extension of this idea – everything can be salvaged [. . .], and all lives given recognition (in an appropriate identity-displaying agency such as a museum)" (2013, p. 160).

A certain product of heritage is inseparable from the efforts to preserve the past, especially its ordinary, mundane aspects: nostalgia.[19] Nostalgia as a longing for a (lost) home is an especially popular and ambiguous concept in post-Soviet memory studies. It is possible to distinguish two ways of using the concept of nostalgia in Lithuanian memory studies: a negative/evaluative one and the neutral/analytical one. The first is used in studies where nostalgia is understood as any remembrance of the Soviet era not marked by clear negative attitudes. In her analysis of the public discourse (such as public holidays, monuments and museums), Čepaitienė notes that post-Soviet memory is framed by two opposite attitudes: the denunciation of the Soviet period and its nostalgic remembrances (2007). Both the interest in Soviet culture (films, art exhibitions, heritage tourism) and positive memories of Soviet everyday life are treated as nostalgia here (Čepaitienė, 2009). Thus, nostalgia not only

19 "If it is the interpretation that is traded, not its various physical resources, then at one level a heritage product is a particular service, such as a visit to a museum, theme park or historic city, but at a deeper level it is an intangible experience – whether it is nostalgia, pleasure, pride or something else – that is the product." (Tunbridge & Ashworth, 1996, p. 27).

starts mistakenly referring to various memories of the Soviet period,[20] but also becomes a negative concept: "Nostalgia for Soviet times is related to anti-democratic, pro-communist, and populist sentiments."[21]

Social anthropologists use the concept of nostalgia more productively by treating it as an analytical tool for understanding social memory. While examining biographical narratives of ordinary people, including workers, Šutinienė observes that the interpretations of the Soviet period recorded in autobiographies are different from the public discourse; they include fewer ideological appraisals, stereotypes and "amnesias" (2003). Anthropologists emphasize the ambivalence of memories and evaluations. The analysis of biographical narratives indicates that today people long for everyday life but not for the Soviet system (Klumbytė, 2004), for sociability rather than socialism (Lankauskas, 2006), for the past "not as a good life but as a life lived well – with dignity, pride, a sense of purpose, with social savvy and skill" (Lankauskas, 2015, p. 53). Soviet nostalgia is studied as a social practice which conveys more about the present than about the past. Klumbytė understands nostalgia as a force structuring post-Soviet social life:

> "[I]n nostalgic reminiscences of Soviet times villagers and marginalized urban residents reclaim visibility, voice their concerns, and appeal for respect, recognition, and inclusive citizenship. By accusing the nostalgics of having a false consciousness and remaking them into social others, the mainstream public [. . .] repeatedly deny their right to a respectful citizenship and exclude them from the post-Soviet modernity project" (2009, p. 110).

Thus, nostalgia here is not a longing for the past, but a comment on current social injustices.

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20 "[. . .] memorial discourses and practices are constituted through a multiplicity of competing genres. Nostalgia is just one of them. Genres and subgenres of memory may be helpful heuristic devices, but they can (and do) quickly distract us from the complexity and complications of 'really existing' memory in social life. They tidy up or model memory into bounded units of analysis. It is not, however, the tidiness but messiness of memory that we need to describe and interrogate" (Lankauskas, 2014, p. 41).

21 "[. . .] Negative labelling of nostalgic people circulates in stories about village and small-town residents drowning in alcoholism, women giving birth to children solely in order to get government benefits, and people either avoiding work or relying on a questionable work ethic and dishonesty" (Klumbytė, 2009, p. 100). The author notes that nostalgia in the post-Soviet public memory is associated with a disease, a virus and similar negative phenomena.

Nostalgia could also be understood as an important tool for creating personal identity. In their study of the autobiographies of the first generation born during the Soviet period, Žilinskienė et al. note that "ordinary" people remember the Soviet period either neutrally or with ambivalence or nostalgically. Nostalgia appears when the Soviet period is remembered as an important time for forming identity (2016). The biographies of industrial communities allocate a particularly important place to nostalgia. Since the working class and industrial work played a very important role in Soviet ideology, a radical "devaluation" of this social class happened after 1990.[22] In the changing political and economic situation, industrial communities encountered not only unemployment and social insecurity, but also an absence of meaning in their life and work. Šliavaitė who has analysed the reactions of the INPP workers to the closure of the plant notes that at least part of this nuclear community grounded their worldview on the ideas of modernity, such as progress and growth. Thus, in the face of de-industrialization, they feel that they are losing not only the economical, but also the ideological foundation (2010a).

Moreover, in the works of anthropologists, post-Soviet nostalgia is "legalized" by comparing the experiences of the Lithuanian population to the experiences of Western societies. For example, one of the most important things that people still hanker after is a standardized life marked by a clear scenario, characteristic of modern societies. Not only post-Soviet, but also post-industrial Western societies long for the stability and security associated with such a life, while trying to deal with the unpredictability and uncertainty of post-modern life (Žilinskienė et al., 2016). The collapse of industry elicits a similar response from local people who can nostalgically remember former industry as the core of a local community, as related both to local history and to the inhabitants' identities and ways of life (Šliavaitė, 2010b).

Although nostalgia is a longing not only for a lost home, but also for a home that has never existed and has been idealized, it is an important part of individual and collective memory. Anthropological memory studies ascribe a formative function to nostalgia, both in the work of creating identity and in dealing with social challenges. On the other hand, nostalgia rarely appears in its pure form and not all positive or neutral, non-evaluative narratives about

22 Kideckel defines the situation of the working class in post-communist Eastern and Central Europe in the following way: "The meaning of the workers' lives and concerns are dismissed and the very category 'worker' or 'industrial worker' is made almost invisible in public discourse" (2002, as cited in Šliavaitė, 2010a, p. 68).

the past are nostalgic (Lankauskas, 2015). Most often, nostalgia gets mixed with recollections of a different type that make up a complex, contradictory and ambiguous memory.

What's Industrial in Industrial Museums?

The central museum presenting industrial heritage in Lithuania is the Energy and Technology Museum opened in 2003 in Vilnius.[23] This is a site-specific museum founded in a defunct electric power plant,[24] which is in a way symbolical, bearing in mind that the basis of modern industrialization is electrification. The museum serves a dual purpose: the preservation of the authentic building of the plant and its equipment as well as the presentation of the history of Lithuanian energy and technology.[25] The museum display consists of four themes. The exhibition "Energetics" tells the general history of electricity and the development of the energy industry in the country, while highlighting the Vilnius power plant. The exhibition "Made in Vilnius" presents technologies and various industries developed in Vilnius. The exhibition "Transport" showcases the historical collection of automobiles and motorcycles. The historical part of the museum display is supplemented by the interactive exhibition called "Science and Technology for Children". This study analyses exhibitions presenting the first two topics.

These exhibitions use several ways of presenting industrial heritage. The major part of the "Energetics" display is based on the object-centred principle; it

23 The museum was opened in 2003, celebrating the 100th anniversary of the first public power station in Vilnius. In the beginning, the museum used only 13 % of the floor space of the former power station. At the end of 2008, the whole building was reconstructed preserving the authentic equipment of the power plant and installing the permanent exhibitions in the 5000m^2 area. In spring 2019, a part of the museum was closed for renovation, which is planned to be finished in 2020. The exhibitions discussed in this text can be seen on a virtual tour: https://etm.lt/virtualus-3d-turas/

24 This was the first public electric plant in Vilnius, which operated from 1903 to 1998.

25 On the museum's website, the main purpose is defined in the following way: "to collect, preserve, research, exhibit and promote the history of Lithuanian energetics and technology and events related to it, to design a display and organise other exhibitions and events". The mission of the museum found in the 2014–2018 strategic plan says that this is a museum "cherishing the object of industrial heritage – the building and equipment of the old electric plant, exploiting the unique cultural educational space dynamically and harmoniously, environment (not only nature) friendly, creating a unique educational, cultural and scientific added value".

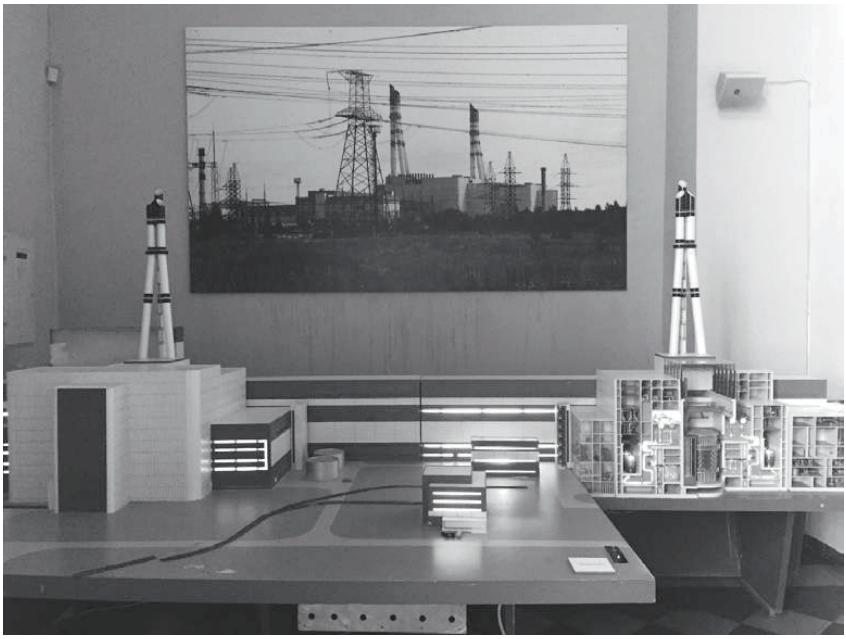

Fig. 1: Model of Ignalina NPP at the Energy and Technology Museum, Vilnius, 2018. Photo by the author.

mostly focuses on displaying technological equipment: steam-boilers, turbines and the plant's control panel. Models of other Lithuanian electric plants, such as the INPP (Fig. 1) and the hydroelectric plant in Kruonis, are exhibited adjacent to it. Technological machines, accompanied by the labels with limited information, are supposed to fascinate visitors with their shapes, magnitude and authenticity. Here, similarly to art museums, visual and textual didactics providing context, in this case presenting the history of the electric plant, are displayed next to objects valuable in themselves. The internalist style of the display might be illustrated by an excerpt from the annotation of the Turbine hall, which is clearly dominated by technological aesthetics at the expense of human work: "The Power plant's control panel was installed on a special platform with marble plates framed by oak fillet and decorated by a clock on the top. The control panel was manned permanently by a person."[26]

26 This is the only mention of work in the annotation of around 150 words length.

Fig. 2: Fragment of the exhibition "Made in Vilnius" at the Energy and Technology Museum, Vilnius, 2018. Photo by the author.

The exhibition "Made in Vilnius" says more about the social and cultural history of local industry, from pre-modern crafts to contemporary laser industry. Naturally, the major part of the exhibition is dedicated to the high industry of the Soviet period. The centre of the exhibition features industrially produced objects, such as sewing machines, vacuum cleaners, television and radio sets, or shoes. Objects perform a dual function here: they represent the products of modern industry (made in Soviet Vilnius) as well as modern domestic appliances, everyday life utensils. The impact of industrialization on the way of life is further emphasized by exhibiting a reconstruction of the apartment typical of the late Soviet period (Fig. 2). The easily recognizable furniture and domestic utensils, the "scenography" of the room and typical interior details (such as a popular domestic plant) easily act as memory triggers for visitors of a certain age, which in turn can invoke nostalgic or other memories. The panels displaying texts and documentary photographs, on the contrary, inform about industrialization as a part of the Soviet regime (by emphasizing such themes as

planned economy or Soviet customs, e.g., product thefts) and as a force organizing the social life (by portraying the factory as the main source of material and social life for the workers).

Interestingly, the museum presents various industries from Soviet period in a positive or neutral light – whether those are the models of electric plants displayed for the viewer's pleasure, or a panel presenting local laser industry, which has been a source of pride since the Soviet period. The celebratory style of displaying technologies does not raise problematic questions such as the safety of nuclear power or the manner in which industry damages the environment. In other words, the museum does not participate in the debate on controversies surrounding practically all modern technological inventions and their use. Ambivalence rather than celebration accompanies the theme of industry in relation to a modern and urban life. The museum presents modernization as a Soviet project. Although the exhibition "Made in Vilnius" shows modern objects and the living environment as important markers of modern lifestyle, the visual-textual panels contextualizing the exhibition emphasize Sovietization rather than modernization. This might be illustrated by the visual-textual panel in which the facts of the growth of industry are presented ("In 1985, there were 84 industrial enterprises employing 114,000 people in Vilnius."). The text with facts is accompanied by a photograph of the interior of a modern flat, its owner hovering dust, and the caption under the photograph declares: "The modernization of domestic environment hardly concealed the abnormality of Soviet life."

Fitzgerald notes that, despite the fact that technological progressivism "in the post-Chernobyl era" is no longer valid, yet for industrial museums, celebratory style interpretations are still the "common-sense" approach. The reasons for that are the following: the museum's natural wish to celebrate its collections; popular sources suffused with technological progressivism (books, television, films), which often serve as reference for museum curators, and also corporate sponsorship of a museum or an exhibition (Fitzgerald, 1996). The fact that the Energy and Technology Museum displays (Soviet) industry in a celebratory rather than critical way, thus presenting a partial view of science and technology, could be somewhat determined by its stakeholders. Besides the Vilnius city municipality, other stakeholders of the museum include organizations directly related to the energy and district heating business: National Association of Lithuanian Energy, Lithuanian Electricity Association, AB Vilnius Heating Networks, and Lithuanian District Heating Association.

A further similar example of a museum, only this time funded by a single corporation, is the INPP Visitor Centre (named as The Communication

Division in the structure of INPP, see the website of the plant). It was founded in 1995 as a department of communication with the society in the then still operating nuclear power plant. Today it functions as the corporation's visitor centre and is the main arena presenting the nuclear energy industry in Lithuania. The Visitor Centre is established in the administration building; its exhibition modestly occupies one room and the adjacent corridor. The main objects in the exhibition space are the model of the nuclear power plant and models of two repositories for radioactive waste (Fig. 3). The rest of the space is occupied by the free-standing panels featuring short texts and one or several photographs accompanying them. The exhibition also displays an original nuclear fuel channel and the spent fuel cask CASTOR, a couple of dummies dressed as workers of the power plant, and also a collection of costumes for actors who participated in the series *Chernobyl*, abandoned after the filming in the nuclear power plant.[27] Historical photographs documenting the construction of the plant are displayed on the walls in the corridor. A television screen presents a live broadcast of the works at the Spent Fuel Storage Pool.

It goes without saying that the main focus of the exhibition is on the INPP itself. First, it presents technical features of the RBMK reactor as well as the history of building and operating the INPP. The second important theme is the decommissioning of the nuclear power plant and the handling of the radioactive waste as well as related technological challenges and solutions. The third topic discussed is the natural and man-made radiation; the use of radiation in various industries, including nuclear energy. One could say that the display, despite one panel presenting Visaginas as the satellite town of the INPP, is produced in the internalist style and concentrates solely on the technological aspect of the nuclear industry and the decommissioning of its objects. Yet the INPP Visitor Centre does not function as a traditional museum where the visitors are invited to explore its contents independently. Almost all visits to the Visitor Centre take place in the form of guided tours. Thus, in order to learn how nuclear industry is narrated here, one needs to join the guided tour.[28] The

27 In spring 2018 episodes of the historical drama TV miniseries *Chernobyl* for HBO were filmed at the INPP. INPP was chosen for filming due to its visual similarity to the Chernobyl nuclear power plant and also because both plants used the same RBMK type reactors.

28 This research is based on the interviews with two employers of the INPP Visitor Centre (26 September 2018), participation in the guided tour around the display of the Visitor Centre and an interview with the guide (27 September 2018) and participation in the guided tour inside the plant (23 September 2019).

Fig. 3: The models of two repositories for radioactive waste at the INPP Visitor Centre, 2018. Photo by the author**.**

contents of the tours are mostly determined by the group of visitors, their background knowledge and interests.[29]

The INPP Visitor Centre organizes two types of visits. The free guided tours take place around the display in the Visitor Centre as described above. Paid tours are organized to the premises of the nuclear power plant, including the reactor hall, the control room and the turbine hall, in which the dismantling of works is being carried out. Thus, the visitors can experience the nuclear power plant in both direct and mediated ways. In both cases the plant is presented or experienced as an exceptional *oeuvre* of science and technology, surprising in its scale, complexity and (former) capacity, in accordance with what Hecht

29 Visitors to the INPP might be roughly divided into two unequal groups: nuclear energy professionals, i.e., those who have specialist knowledge in this area, and other visitors, i.e., the so-called lay public. In this study I focus on the second group of visitors and the narrative about nuclear industry offered to them.

calls "nuclear exceptionalism" (2012). For instance, the story in the Visitor Centre begins with the highlights such as the fact that in 1993, the INPP was included among the Guinness World Records because it produced the largest percentage of the general electric energy needed by the state throughout the entire history of nuclear energetics. The visitors walking around the power plant are astonished by the size and complexity of its premises and equipment, the embodiment of technological expertise and mastery, an experience similar to the admiration of complex and great works of art. Yet a visit to the power plant is also about the fascination with grandiosity and insecurity at once, since we are dealing with highly dangerous technological outcomes such as radioactive waste here. During the tours, questions are often asked about the radiation level; sometimes a strong fear of radiation is expressed.

The participants of tours into the so-called controlled zone are most impressed by the very procedure of entering the power plant. The visitors need to book in advance, their identities are checked, all personal items should be left behind, one has to change all clothes down to underwear, wear helmets, gloves and, in some places, a respirator. After the tour, one not only gets changed, but also radioactivity levels are checked and if they have increased, one might have to take shower. In the power plant that is being dismantled, the same requirements of radiation safety and nuclear security are applied as were in place while it was operating, thus producing some sort of performance involving the participants of guided tours. Therefore, visitors can perceive the magnitude and danger of the power plant as a specific technological object live, through bodily and sensory experience.

The theme of safety is central both to the Visitor Centre and while walking in-situ, yet it is not questioned critically. One of the main references without which no tour can take place is the question of Chernobyl: "The negative shadow of Chernobyl is always near us." Tour guides discuss this topic with the visitors not as a wider and still unsolved (or unsolvable) problem of nuclear technology and industry, but as a particular case caused by the faulty management of Soviet nuclear industry. Chernobyl is presented not as a disastrous consequence of the nuclear industry, but as an accident that has prompted positive changes such as technological safety improvements in operating nuclear power plants, including the INPP.

A further important topic is the decommissioning of the INPP, i.e., the process that is taking place now, which can be experienced while walking around the power plant or watching a live broadcasting at the Visitor Centre. The decommissioning is presented as a process at least as complex as the construction and management of the most powerful nuclear reactors some time

ago, because this is the first project of immediate dismantling of RBMK type reactors in the world.[30] While briefing the visitors about the challenges of decommissioning, the tour guide mentions that it is still not clear how to destroy radioactive graphite, and the global community of nuclear industry is waiting for the results of an experiment that will be carried out at the INPP. Radioactive waste, its longevity and means of managing it are also discussed during the tours. One of the main facts stimulating the visitors' (lack of) understanding and imagination is information that approximately 500,000 years will be needed for the used fuel to become equal to natural uranium in terms of radio toxicity. The guide presents another fact as a scientific (and political) challenge: nobody knows yet how the long-lasting radioactive waste will be managed after the 50 years during which it will be preserved in constantly monitored containers.

Depending on the visitor group interests, topics related to the social and cultural history of the INPP are also considered. While visiting the power plant, one has an opportunity to talk to the employees, the majority of whom have been working here since the very opening of the plant. From the people working in the plant one could hear stories about their job and life story, learn why they came to the INPP and how they settled here. The guides also present curiosities of living in a closed city known as Soviet atomgrad. The visitors are interested in the urban development of the city built from scratch, the multinational and bilingual community still living here, the health and diseases of the plant personnel or even fishing in the waters of the Drūkšiai Lake which was used to cool the reactors. The effect of nuclear industry on the environment, similarly to the theme of safety, is not discussed critically. For example, the guide, while talking about fishing, mentions that due to the impact of the INPP, the temperature of water in the lake has risen several degrees, in the wake of which the flora has changed and some kinds of fish have disappeared. Yet she also points to a positive change: more carps have emerged in the lake, and next to the water pumps, one could catch fish with bare hands.

As a place of nuclear industry heritage, the INPP is a paradoxical place. The defunct nuclear power plant, thanks to the complicated and partially

30 There are three possible options for decommissioning: immediate dismantling, deferred dismantling, and safe conservation and entombment. Ignalina NPP uses immediate dismantling when the equipment is dismantled practically immediately after the closure of reactor's operation. https://www.iae.lt/en/activity/decommissioning/153

experimental decommissioning process, is still an actively functioning nuclear enterprise[31] and will remain so at least until 2038. Here, the history of nuclear industry is both demonstrated and simultaneously destroyed; although it is practically impossible to destroy it, bearing in mind the longevity of radioactive waste. Perhaps, the planned nuclear waste repositories will at some time become places of nuclear industry heritage. Today the nuclear industry heritage is celebrated via emphasizing the uniqueness of the INPP by pointing out that this was the most powerful nuclear power plant in the past and is an exceptional decommissioning project in the present. Compared to the Energy and Technology Museum, it is interesting that the Soviet story-line is almost eliminated in the narrative of the INPP, although Soviet legacy is vividly experienced during the visit, e.g., through the domination of the Russian language inside the power plant.[32] The Visitor Centre presents the INPP as a scientific and technological oeuvre rather than a product of the complex sociotechnical system. Museum narratives emphasize the safety of nuclear industry,[33] although physical experiences during the visit may evoke insecurity and nuclear fear.

If both museums with permanent displays under discussion here present Soviet industry as more or less a history of technological innovation, various temporary museum projects rather focus on people's life around the industries. The first such project was a travelling exhibition "Dream Factories. Industry and Modernism in the Baltic Sea Region 1945–1990" hosted by the Energy and Technology Museum in autumn 2009. Organized by The Workers' Museum in Copenhagen and the National Cultural Heritage Agency under the Danish Ministry of Culture, the exhibition stemmed from a three-year collaborative scholarly research project carried out at Northern and Baltic universities with the aim "to examine the connections between industry and modernism and explore how technology, industry and modernism have affected the everyday life and culture of the North European people" (Drėmaitė, 2009, p. 142).[34]

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31 According to the data of the 1 January 2019, 1,901 employees were involved in the dismantling of the power plant. Around 5,000 people were employed when the power plant was operating.

32 The aforementioned possibility to talk to an employee of the power plant means to speak Russian.

33 Emphasis on security is a common practice in visitor centres of nuclear power plants in order to counter anti-nuclear arguments and sentiments.

34 The historian of architecture, Marija Drėmaitė, who participated in the research project, was responsible for the Lithuanian part of the exhibition, in collaboration with the Energy and Technology Museum and Vytautas Suslavičius, an engineer of the Elektrėnai power plant.

The exhibition was based on the first-person approach and told stories of the life and work of seven workers at seven different industrial enterprises in Soviet Lithuania, Latvia and Estonia as well as social democratic Denmark, Finland, Norway and Sweden. The Lithuanian case was presented through the story of Algis Mišinis who worked on the construction of the largest industrial enterprise of the 1960s – the Lithuania Power Plant and its satellite city, Elektrėnai. The story of every protagonist of the exhibition consists of six themes: dreams about the factory, work at the factory, factory and home, factory and leisure, factory and the society, and dreams that have been changed. Thus the focus is not on the state or politics but on the role of workers in the process of modern industrialization and how abstract ideas of modernization were implemented in their daily life (Drėmaitė, 2009).

This exhibition not only returned the industrial past to its legal heirs, the workers, but also introduced other important revisions in the discourse around Soviet industry. While comparing the stories of workers in Soviet and capitalist states, common features of industrial societies emerged, such as universal education, healthcare and homes, modern consumption and leisure, mechanized and rationally organized work. In both political systems, according to Drėmaitė, "the directions and ideology of the processes of modernization were identical. We must admit that, despite the Soviet system, there were economic achievements in the Lithuanian SSR as well"[35] (2009, p. 157). Yet more importantly, this project focused not only on the historical factual material, but also on subjective memories and emotional experiences. These are the members of the industrial society who share their life stories, dreams, attachments and disappointments. The beginning of high industry is remembered as a period of dreams and faith in a better future; the collapse of industry is perceived as a personal loss: "At the beginning, when we were still young, we believed in a better future. We lived very well then. Yet later disappointment came: it seemed that everything stopped and would not change, whether we do anything or not. After independence, everything started to collapse, many people did not adapt to the new situation" (quoted from Drėmaitė, 2009, pp. 154–155). The exhibition makes it clear that, despite the differences in political systems, people's dreams about the modernization of life were related to the goals of personal welfare, including material wellbeing.

35 Despite the similarity among industrial societies, Drėmaitė emphasizes also the particularities of Soviet industrialization, which resulted from, for instance, Soviet planned economy and the limitations of consumer good and trade (2009).

The first-person approach is characteristic also of another temporary exhibition organized in quite an unexpected place: at an art museum. In 2017, The M. K. Čiurlionis National Museum of Art opened a community gallery in one of its venues together with the inaugural exhibition, titled "The Great Industry". The exhibition presented the history of Kaunas as an industrial city as well as the life in two textile factories in the late Soviet period. The exhibition was co-produced together with two former industrial communities which live next to already defunct factories. People's memories and curious objects from private collections were collected as a basis for the exhibition narrative. The narrative was created around two central figures – two female artists who worked at Soviet textile factories. Both of them were the first artists who went to work in industry; both of them, now in their 90s, are extraordinary personalities. Their personal lives and work stories, together with mundane but curious objects (such as a jacket made of award-winning fabric, examples of special elastic used for female underwear or even an artificial vein created by a textile factory technologist), suggested different nuances in the history of Soviet industrialization and modernization. The exhibition shed some light on industrial production as a place for creativity and discoveries, on gender issues in Soviet industry, and on the participation of Soviet Lithuanian industry in the Cold War competition.

Like "Dream Factories", the exhibition "The Great Industry" was not so much about industry as technology, but about people who worked in the industry. As such, based on subjective memories and emotional experiences, "The Great Industry" exhibition provoked the question of nostalgia for the Soviet past. The production of a community exhibition is a complex curatorial work involving forging contacts, earning trust, long communication and collaboration with various people. It emerged, however, that one of the main problems in the process of creating this exhibition was the fear of nostalgia. The curator of the gallery, Auksė Petrulienė, herself an artist experienced in community art projects, admitted in an interview: "While inviting people to join the project, I was afraid to encounter nostalgia for Soviet times but luckily, nobody expressed any nostalgic feelings." Thus, Soviet nostalgia is perceived as a bad thing, which has no place in the museum, even if a part of the society has this feeling. This story can be understood not as the museum's intention to present a partial view of the past, but as a fear of Soviet nostalgia provoked by the earlier discussed negative concept of nostalgia which prevails in current memory culture.

The third and last example of attempts to turn Soviet industry into a museum narrative through social and cultural history is the Museum of Visaginas. This

Fig. 4: A view of the permanent display at Visaginas Museum, Visaginas, 2019. Photo by the author.

museum is still in the process of being created,[36] thus it is only possible to analyse its realized temporary projects to date. It was founded in 2014 as a department of the Visaginas Culture Centre. The museum consists of a modest display in one hall, several rooms allocated for the office and the collection and one museum worker. Being so small and dependant on the Culture Centre, also still lacking a strategy approved by the municipality, it is still an interesting example of work with the history of industrial community. What is now visible and accessible at the Museum of Visaginas is an artistic installation "Valley of Butterflies", which contains celebratory wishes to Visaginas written by both the former and current residents of the town (a result of an interactive internet project "Celebrate Visaginas") (Fig. 4). Together with a small photography

36 This research is based on the interview with the employer of the museum, 6 March 2019.

exhibition documenting the life in the nuclear town, this artistic installation marks symbolically the very orientation of the museum collecting practice.

The rare visitors who see the museum's collection, stored in several rooms, are surprised when they find archaeological and folk art items here, which refer to the history of the place before the emergence of the town in 1975. Sometimes this is explained as an attempt by Lithuanians working at the Culture Centre "to narrate the history of Visaginas as having pre-socialist layers, and thus reinstall their symbolic authority over the place" (Freimane, 2016a, p. 43). However, ethnographic objects make up only a part of the museum's collection. It also preserves a large collection of photographs by the main photographer of the town who recorded Visaginas from 1978 to 2003 (they are in the process of being digitalized). The collection also consists of albums, medals, badges and other "souvenirs" that had been owned by various organizations, including the workers of the INPP, as well as items of Soviet daily life and technology (from telephones and photo cameras to collections of cosmetics) and even a dried Christmas tree decorated with Soviet toys. Yet, according to the museum's curator, they are interested not in old things, but in people's stories. Mass produced stuffs from the Soviet period usually do not have a clear artistic or historical value, thus only narratives attesting to the experiences, memories and identities of the community can afford them value and turn them into heritage.

While focusing on the testimonies of the community, the museum has several projects in-process. A good example of such an activity is a project about the history of the Visaginas Acrobatic Sports School. It is interesting because it was the only professional school of acrobatics in Soviet Lithuania and also because it was initiated not by the city authorities, but by two sportsmen. The museum volunteers collect interviews with the school's coaches and their pupils; digitalize their photographs, albums, medals and other things; and create a virtual exhibition on this basis. According to the museum curator, this will be an exhibition not only about some of the city's past, but also an impulse to rethink the present by demonstrating how even in a Soviet-planned town, unplanned grassroots initiatives could be born "from below".

Another important aspect is that the museum still does not attempt to expand its material collection and rather concentrates on oral history and the digitalization of private archives. Collecting is perceived here not as collecting exhibits, but as a way to start contacts with the local community and encourage it to create the museum together. The Museum of Visaginas sees itself not as storage of things, but as a tool for people to speak about themselves to others. It is a question for the future what role nuclear industry will play in this story. According to the museum curator, local residents want to talk about the nuclear

power plant as an important part of the identity of the town; they appreciate the exceptional urbanism and architecture of the atomic town, the particularities of life in it. Yet the life in the town comprises increasingly more varied aspects because most of its inhabitants did not even work at the nuclear power plant. Their personal memories and stories reveal the diversity of the city, which the museum would like to represent. Thus, so far, the narrative about the modern living environment and collective forms of leisure determined by industrial production, whether it was Soviet or nuclear industry, prevail in the Museum of Visaginas. As the museum curator points out, "political systems differ but people's goals and needs in life are similar".

Interestingly, museum projects oriented towards (former) industrial communities emphasize not the past, but the present or even the future. Both the community gallery in Kaunas and the Museum of Visaginas stress the significance of the communal and partially operate as places of community activism. While creating the exhibition "The Great Industry", one of the collaborating communities lost their premises because the municipality cut their funding, thus the museum offered its premises for the meetings of the community members. Moreover, the museum publicized this problem both in the exhibition itself and in the media. The Museum of Visaginas also centres its projects on current urgent issues. For example, the lack of community initiatives from below has served as an inspiration to revive the history of the Acrobatic Sports School. Thus, we could say that social and cultural narratives about the industrial past seek to recover values characteristic to an industrial society, such as social equality, collectivity and optimistic hope for a better future. It leaves aside its negative features, such as unification, the absolutism of rationality or technocratic fundamentalism (Drėmaitė, 2009).

Thus, what is the meaning of industrial in post-Soviet industrial museums and museum projects in Lithuania? One could say that it is both industrial technology and the life of industrial communities. One tendency is to celebrate the achievements of science and technology through the preservation of authentic buildings and equipment, presenting machines as *objets d'art* and providing the experience of the sublime of technology. Despite the fact that those technologies were created during the Soviet period, they are perceived positively, in the spirit of technological progressivism. A critical evaluation of the Soviet aspect emerges when the impact of industrialization on the society is presented. The modernization of life is understood here first as subjugation of the society to the Soviet regime. The other, opposing, tendency is only emerging via temporary and work-in-progress type projects. They seek to musealize the social and cultural history of Soviet industry through collecting and displaying

subjective stories, experiences and memories of (former) industrial communities. Narratives of work and leisure rather than that of "work without workers" (Davies, 1996) prevail here. These projects contribute to the historical legitimacy and agency of (former) industrial communities, since they try both to articulate local and communal identities, and to re-affirm the values of industrial society. Both tendencies lack a critical assessment of the impact of modern industries on the environment and on people's lives.

The Narration of Soviet Industry in History Textbooks

A similar question "what's industrial" can be asked also while reading Lithuanian history textbooks, which address the Soviet past. Soviet industrialization as well as the related urbanization and modernization are discussed in a more or less detailed manner in all 5th, 10th and 12th grades textbooks.[37] These topics are included also in normative documents regulating history teaching in Lithuanian general education schools: "The General Curriculum Framework for Basic Education" (2008) and "The General Curriculum Framework for SecondaryEducation" (2011). According to the curriculum, students of the 5th grade should study the following topics of the Soviet period: Soviet occupation (through the annihilation of the population and resistance against the occupants) and everyday life of the people in Soviet Lithuania. History should also be taught through references to both the past and the present of the family and native place. Students of the 10th grade analyse both the history of Lithuania and global history. The history of the Soviet period should emphasize the following topics: occupation and resistance, the impact of science and technology on the economy and the development of the society, the development of culture and everyday life. In the 12th grade the greatest attention should be paid to the history of the society by referencing politics, economics and culture to reveal the changes in public life. The studied topic "The Society during the Times of Cold War and Collapse of Communism" should cover guerrilla war and dissident resistance to the Soviet regime, collaboration with the regime and adaptation to it, the "Sovietization" of Lithuanian economy and society as well as liberation from the regime.

37 Among the 20 analysed textbooks, the only 11th–12th grade textbook written by Makauskas says almost nothing about Soviet industry and its impact on people's lives. It narrows this down to three sentences claiming that heavy industry started to be developed in Lithuania from 1950 and industrialization was a means to Russify Lithuania (2006).

Tab. 1: History textbooks covering the period of Soviet Lithuania and approved by the Ministry of Education, Science and Sport of the Republic of Lithuania as valid for the academic year 2018–2019. Compiled by the author.

5th Grade History Textbooks				
No.	**Author(s)**	**Title**	**Publisher**	**Year**
1.	Jakimavičius Viktoras	Gimtoji šalis Lietuva. Lietuvos istorijos skaitiniai. 5 kl.	Alma littera	1998
2.	Zakarauskienė Izolda	Lietuvos istorija. Skaitiniai. 5 kl.	Agora	2000
3.	Brazauskas Juozas	Lietuvos istorija. Skaitiniai. 5 kl.	Šviesa	2000
4.	Stašaitis Stanislovas, Šačkutė Jūratė	Tėvynės istorijos puslapiai. Lietuvos istorijos vadovėlis. 5 kl.	Margi raštai	2000
5.	Litvinaitė Jūratė	Palikimas. Istorijos vadovėlis. 1/2-oji kn. 5 kl. (serija „Šok“)	Šviesa	2007
6.	Laužikas Rimvydas, Mickevičius Karolis, Tamkutonytė-Mikailienė Živilė, Kapleris Ignas	Kelias. Istorijos vadovėlis. 5 kl. 2 d.	Briedis	2008
7.	Petreikis Darius, Litvinaitė Jūratė, Meškuotis Faustas, Ramoškaitė-Stongvilienė Rūta, Bitautas Algis, Stankutė Simona	Istorija. 5 kl. (serija „Atrask“)	Šviesa	2014
10th Grade History Textbooks				
1.	Kasperavičius, Algis, Jokimaitis, Rimantas	Naujausiųjų laikų istorija. 10 kl.	Kronta	2003
2.	Brazauskas, Juozas, Makauskas, Bronius	Lietuvos praeities puslapiai. Istorijos vadovėlis. 3-ioji kn. 10 kl.	Šviesa	2004
3.	Kapleris, Ignas, Meištas, Antanas, Mickevičius, Karolis, Laužikienė, Andželika, Tamkutonytė-Mikailienė, Živilė	Laikas. Istorijos vadovėlis. 2 d. 10 kl.	Briedis	2017 (2007)
4.	Bakonis, Evaldas	Tėvynėje ir pasaulyje. Istorijos vadovėlis. 10 kl.	Šviesa	2009
5.	Kraujelis, Ramojus, Streikus, Arūnas, Tamošaitis, Mindaugas	Istorijos vadovėlis. 2 d. 10 kl. (serija „Raktas“)	Baltos lankos	2010

(*continued on next page*)

Tab. 1: Continued

12th Grade History Textbooks				
1.	Mäesalu, Ain, Kiaupa, Zigmantas, Straube, Gvido, Pajur, Ago	Baltijos šalių istorija. 10–12 kl.	Kronta	2000
2.	Civinskas, Remigijus, Antanaitis, Kastytis	Lietuvos istorija. 12 kl.	Vaga	2001 (2000)
3.	Makauskas, Bronius	Lietuvos istorija. 11–12 kl., 2-oji kn.	Šviesa	2006 (2000)
4.	Gečas, Algirdas, Jurkynas, Juozas, Jurkynienė, Genia, Visockis, Albinas	Lietuva ir pasaulis. Istorijos vadovėlis. 12 kl.	Šviesa	2001
5.	Kaselis, Gintaras, Kraujelis, Ramojus, Lukšys, Stasys, Streikus, Arūnas, Tamošaitis, Mindaugas	Istorijos vadovėlis. 2 d. 12 kl.	Baltos lankos	2008
6.	Kapleris, Ignas, Laužikas, Rimvydas, Meištas, Antanas, Mickevičius, Karolis	Laikas 12. Istorijos vadovėlis. 1/2 d. 12 kl.	Briedis	2016 (2011)
7.	Anušauskas, Arvydas, Kaselis, Gintaras, Kraujelis, Ramojus, Lukšys, Stasys, Streikus, Arūnas, Tamošaitis, Mindaugas	Istorijos vadovėlis. 2 d. 12 kl.	Baltos lankos	2012
8.	Navickas, Virginijus, Svarauskas, Artūras	Istorijos vadovėlis 12 kl. (IV gimnazijos kl.)	Ugda	2015

The topics of industrial, urban and modern life are presented differently in textbooks written by different authors and published at different times (Tab. 1).[38] A separate chapter could be dedicated to industry and everyday life, for example: "Huge Factories Arose" (Jakimavičius, 1998), "Everyday life of People during the Soviet Period" (Laužikas et al., 2008) or "The Sovietization of Lithuanian Economy and Society" (Anušauskas et al., 2012). These topics may also form an integral part of the narrative about Soviet politics (Civinskas & Antanaitis, 2001) or public life during different periods of Khrushchev's "thaw" and Brezhnev's "stagnation" (Kaselis et al., 2008; Kapleris et al., 2016; Navickas

38 Today textbooks published earlier than the aforementioned normative documents are also approved.

& Svarauskas, 2015). In the 5th grade textbooks, industry and modern life are sometimes described as part of the history of the entire Soviet period (Petreikis et al., 2014; Stašaitis & Šačkutė, 2000) or even of all general history of Lithuania (Litvinaitė, 2007). Despite these differences, an analysis of Lithuanian history textbooks could trace prevailing narratives about the Soviet industrialization, urbanization and modernization.

In most cases industrialization is presented as an important feature of Soviet period life. This is immediately noticeable upon looking through various visual highlights which appear in textbooks. The beginning of high industry appears among the dates of the most important events of the Soviet period. For example, in the chronological table highlighted in the 5th grade textbook, the 1960s as the period during which large factories were constructed is presented next to the dates of the Nazi and Soviet occupations, deportations, formation of collective farms and the Sajūdis movement for independence (Stašaitis & Šačkutė, 2000). Industry appears even in more telling examples of infographics. In the 5th grade textbook, the chapter "Life in Soviet Lithuania" opens with a chronological table with only two dates: 1950 as the year when the Lithuanian Anthem was banned and 1980, the year when the Mažeikiai Oil Refinery began operating (Laužikas et al., 2008) (Fig. 5). And in the 12th grade textbook, the chapter "The Lithuanian Society: from the Soviet Period to the Restoration of Independence" opens with the map of Lithuania where only the large industrial enterprises are marked (Mažeikiai Oil Refinery, Lithuania Power Plant in Elektrėnai, Jonava Nitrogen Fertilizer Factory and INPP) together with strategic Soviet military objects, such as airports and the nuclear weapons storage[39] (Kapleris, 2016).

The industrial in textbooks most often denotes various industries themselves as well as factories and industrial enterprises. New industries, such as energy, metal, chemical, and electronics industries, that emerged during the Soviet period are proudly listed in the textbooks. In almost all textbooks, in both texts and photographs, the largest Soviet industrial companies that operated in Lithuania are presented.[40] There are often attempts to demonstrate the rapidity

39 The map has to illustrate a clearly exaggerated statement by the textbook's authors that "Occupation government turned the LSSR into a giant military base" (Kapleris et al., 2016, p. 215).

40 Such as the Kaunas Hydroelectric Power Plant, Elektrėnai Power Plant, Ignalina Nuclear Power Plant, Mažeikiai Oil Refinery, Jonava Nitrogen Fertilizer Factory, Kėdainiai Chemical Plant, Akmenė Cement Plant, Kinescope Plant in Panevėžys and Alytus Cotton Textile Factory.

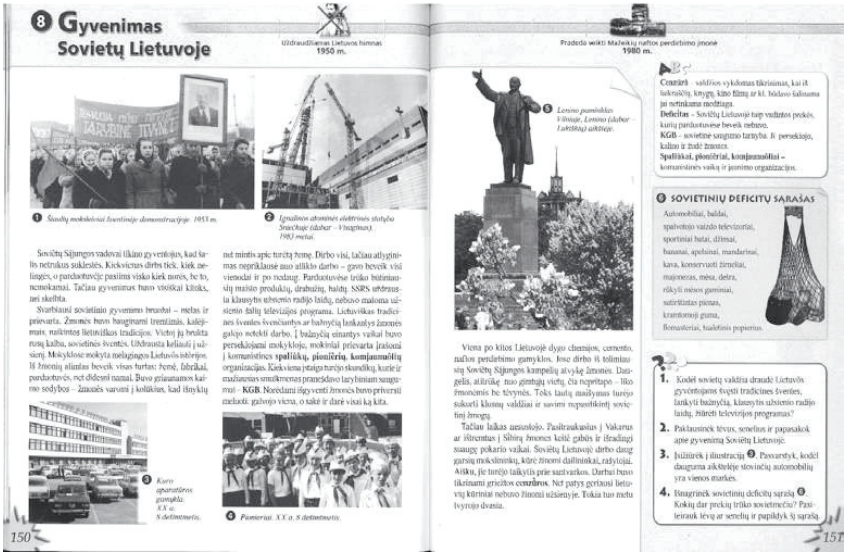


Fig. 5: Fragment of the history textbook by Laužikas, R. et al. (2008).

and the vast scale of industrialization through linguistic means. Industrial enterprises are called "industrial colossi" (Brazauskas, 2000; Stašaitis & Šačkutė, 2000), "industrial giants" (Kraujelis et al., 2010; Bakonis, 2009; Kaselis et al., 2008). Rapid industrialization is described with such phrases: "Factories [. . .] sprouted in Lithuania one after another" (Laužikas et al., 2008, p. 151), "Soviet government decided to turn our land of agriculture into the land of factories and plants" (Stašaitis & Šačkutė, 2000, p. 168). Sometimes the power and modernity of Lithuanian industrial enterprises is emphasized: "In 1965 [started operating] the Kaunas Artificial Fibre Factory, the most modern factory of chemical industry. This was one of the largest factories in the Soviet Union and Europe. The largest factory of this profile in the Soviet Union was the Vilnius Drill Factory" (Brazauskas & Makauskas, 2004, 150).

Energetics is often singled out among other industries as the basis of industrialization in history textbooks. Photographs of electric power plants in Kaunas, Elektrėnai and Ignalina dominate amongst images of other factories with the INPP playing a major role. The texts not only single out the date (1983) when the INPP was launched, but also emphasize its exceptional status by mentioning that this was the only nuclear power plant in the Baltic States, that its

reactor was the most powerful in the world, included among Guinness World Records (Navickas & Svarauskas, 2015; Kapleris et al., 2017; Kapleris et al., 2016). The 5th grade textbook explains how a nuclear power plant operates and in what way it is different from other electric plants by pointing out the low cost of nuclear energy (Jakimavičius, 1998), although history textbooks usually do not explain how various industries operate and focus on their historical development instead. One could say that the INPP is presented as a symbol of modern industrialization although, as we shall see later, not necessarily in a positive sense.

The formation of the urban and modern society in Lithuania is widely discussed as a consequence of industrialization in history textbooks. The motif of rapid growth and radical changes also prevails here. The textbooks emphasize the fact that rapid industrialization resulted in extensive construction: multistorey blocks of flats, schools, kindergartens were built, new residential districts and even new cities (Elektrėnai, Sniečkus) were designed, new roads were built and infrastructure improved on a mass scale. The chapters on Soviet social life in textbooks are most often illustrated with the photographs of new residential districts. The scale of urbanization that took place in the 1960s and 1970s, i.e., migration from countryside to the city, is emphasized. Sometimes this is illustrated by providing numbers: in 1960, 40 % of the Lithuanian population lived in the cities, and in 1980, already around 60 % (Navickas & Svarauskas, 2015; Kraujelis et al., 2010). The authors of most textbooks point out that during the Soviet period, Lithuania was transformed from an agricultural country into an industrial one, and Lithuanian society became urban for the first time in history. Yet next to the quite neutral and even celebratory listing of the facts about growth and change, the textbooks provide a somewhat negative image of Soviet modern life. It is possible to distinguish several dominating narratives about Soviet industrialization and modernization in history textbooks.

First, the narrative of a centralized/colonial control of industry prevails. The textbooks allocate the largest amount of space to the discussion of how Lithuanian industry functioned in Soviet economy based on centralized administrative planning. The authors criticize the flawed process of Soviet industry when imported materials were used for local production, and the produced goods were distributed around the entire Soviet Union in a centralized manner. The negative attitude is also expressed in the titles of the chapters such as "Producing for Everyone, Destroying Our Nature" (Stašaitis & Šačkutė, 2000) or "In the Grip of Planned Economy" (Kapleris et al., 2016). Large industrial companies and factories are called not only the giants of industry, but also the "monsters of industry" (Kapleris et al., 2017). Because of the centralized

distribution of production, Soviet industry is discussed as an obvious form of colonial exploitation (Kraujelis et al., 2010; Anušauskas et al., 2012). Moreover, Lithuanian industry is linked not to local, but to colonial needs. On the one hand, industry dependent on imported materials had to guarantee the irreversible integration of Lithuania into the Soviet Union (Kaselis et al., 2008). On the other hand, local industry was used to produce for the military needs of the Soviet Union (Kapleris et al., 2017; Anušauskas et al., 2012). Several authors present Soviet industry as "alien" by pointing out that it was created without taking into account local conditions and traditions (Kapleris et al., 2016).

The stories about the "alien" Soviet industry are enhanced by the second narrative linking industrialization to the Russification of the country. Although Russian immigration to Lithuania was relatively insignificant, in comparison with Latvia and Estonia,[41] Russification performs an important role in the narratives about Soviet industry. Most authors of textbooks state that industrialization itself was a means to Russify Lithuania, since immigration from all over the Soviet Union was necessary to both build and man large factories.[42] The satellite city of the INPP, Visaginas, is often quoted as a typical example of "Soviet colonialism", since around 30,000 Russian-speaking immigrants moved there to live (Kaselis et al., 2008; Anušauskas et al., 2012). Next to the prevailing narrative of industrialization as Russification, an alternative story can be found, mostly in the 12th grade textbooks. Some authors present the reform of Soviet economy that took place from 1957 to 1962 (the so-called *sovnarkhoz* system), which gave more power to local authorities for a short while and encouraged regional planning. The consequence of this reform for Lithuanian industry was an even distribution of factories across the entire territory (Civinskas & Antanaitis, 2001; Kaselis et al., 2008; Anušauskas et al., 2012; Navickas & Svarauskas, 2015; Mäesalu et al., 2000). This allowed for the hiring of local people in industry and "saved [us] from the influx of colonists" (Gečas et al., 2001, p. 335). Interestingly, the procurement of work for local inhabitants and the preserved certain "Lithuanianness" of industry is generally presented

41 During the entire Soviet period Lithuanians constituted around 80 % of the Lithuanian population.

42 "In order to develop industry many working hands were needed. This was a pretext to send workers from other republics of the USSR. In particular, many arrivals came to build such giants of industry as the Mažeikiai Oil Refinery and Ignalina Nuclear Power Plant." (Bakonis, 2009, p. 137). Similar stories are presented in other textbooks; see Laužikas at al., 2008; Brazauskas & Makauskas, 2004; Kaselis et al, 2008; Anušauskas et al., 2012; Makauskas, 2006; Mäesalu et al., 2000.

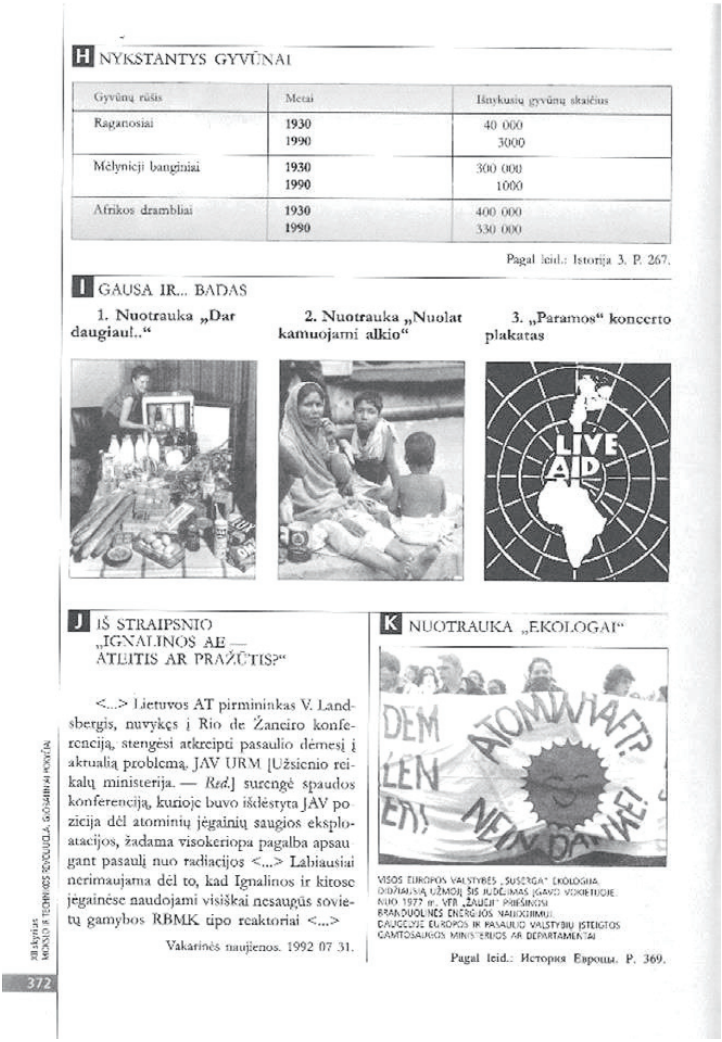
in textbooks not as a positive aspect of industrialization, but as a deliverance from yet another of its negative aspects.[43]

The third narrative, which strongly supplements the negative image of Soviet industry, presents pollution as a consequence of industry. The theme of ecology is discussed in almost all textbooks. Soviet production is condemned for polluting the environment, for not taking care of environment protection and hiding accidents from the society. Some textbook authors dedicate separate chapters to the topic of ecology, with graphic titles, e.g., "The Blackened Sky and Dead Trees" (Stašaitis & Šačkutė, 2000) or "The Threat of Ecological Catastrophe" (Kapleris et al., 2017). The factories are referred to as "horrors" of nature (Stašaitis & Šačkutė, 2000), facts about the impact of pollution on the number of oncological diseases are used (Kapleris et al., 2017), and witnessed accounts of accidents in industrial plants are presented. The texts are accompanied by photographs depicting views of contaminated soil or withered trees. The INPP has a symbolical place in this narrative. The textbooks present the INPP not only as an especially powerful, but also a very dangerous industrial plant. They even call it "a nuclear bomb of delayed action" (Kapleris et al., 2017). The authors mostly associate the threat of the INPP with the accident at Chernobyl by pointing out that both electric power plants used the same type of unsafe reactors (Kapleris et al., 2017; Bakonis, 2009; Kapleris et al., 2016, Gečas et al., 2001). Texts are illustrated with memories of contemporaries and images from the Chernobyl nuclear power plant and photographs from the meetings of anti-nuclear activists in Lithuania and abroad (Kapleris et al., 2017, Gečas et al., 2001) (Fig. 6).

The fourth narrative presents the urban and modern life which stemmed from industrialization as the Sovietization of Lithuanian society. The authors of textbooks argue differently in order to demonstrate social processes and everyday life as a part of the Soviet regime. One way is to associate the events and processes in the past with negatives. We can find such a simplistic attitude in the 5th grade textbooks, in which Soviet everyday life is presented as "grey"[44]

43 A sole exception is the textbook by Navickas and Svarauskas which argues that the territorial distribution of industry helped to solve the occupational problem in the province (2015, p. 157).

44 "The Greyness of Soviet Everyday Life" is the title of one of three topics in the textbook's chapter "Life in the Soviet Countryside and in the City" (Petreikis et al., 2014). Greyness refers here to the deficit of goods and uniformity of fashion.



H NYKSTANTYS GYVŪNAI

Gyvūnų rūšis	Metai	Išnykusių gyvūnų skaičius
Raganosiai	1930	40 000
	1990	3000
Mėlynieji banginiai	1930	300 000
	1990	1000
Afrikos drambliai	1930	400 000
	1990	330 000

Pagal leid.: Istorija 3. P. 267.

I GAUSA IR... BADAS

1. Nuotrauka „Dar daugiau!..“

2. Nuotrauka „Nuolat kamuojami alkio“

3. „Paramos“ koncerto plakatas

J IŠ STRAIPSNIO „IGNALINOS AE — ATEITIS AR PRAŽŪTIS?“

<...> Lietuvos AT pirmininkas V. Landsbergis, nuvykęs į Rio de Žaneiro konferenciją, stengėsi atkreipti pasaulio dėmesį į aktualią problemą. JAV URM [Užsienio reikalų ministerija. — *Red.*] surengė spaudos konferenciją, kurioje buvo išdėstyta JAV pozicija dėl atominių jėgainių saugios eksploatacijos, žadama visokeriopa pagalba apsaugant pasaulį nuo radiacijos <...> Labiausiai nerimaujama dėl to, kad Ignalinos ir kitose jėgainėse naudojami visiškai nesaugūs sovietų gamybos RBMK tipo reaktoriai <...>

Vakarinės naujienos. 1992 07 31.

K NUOTRAUKA „EKOLOGAI“

VISOS EUROPOS VALSTYBĖS „SUSERGA“ EKOLOGINA
DIDŽIAUSIĄ UŽMOKĮ ŠIS JUDĖJIMAS ĮGAVO VOKIETIJOJE
NUO 1977 m. VFR „ŽALIEJI“ PRIĖŠINOSI
BRANDUOLINĖS ENERGIJOS NAUDOJIMUI.
DAUGELYJE EUROPOS IR PASAULIO VALSTYBIŲ ĮSTEIGTOS
GAMTOSAUGOS MINISTERIJOS AR DEPARTAMENTAI

Pagal leid.: История Европы. P. 369.

Fig. 6: Fragment of the history textbook by Gečas, A., et al. (2001).

(Petreikis et al., 2014) and "lacking freedom"[45] (Litvinaitė, 2007). The textbook chapter about social life in Soviet Lithuania begins with the statement that is repeated in the summary of the chapter: "The most important features of Soviet life were falsehood and violence" (Laužikas et al., 2008, p. 150). Another way, mostly used in the 10th grade textbooks, is to construct an argument based on the principle of thesis and antithesis. Thus, all achievements of modern life are diminished and acquire a different, almost opposite, meaning. The telling examples are excerpts from different textbooks: "Healthcare was free in the Soviet period, but one had to wait for hours queuing up in the clinics . . ." (Kapleris et al., 2017, p. 232); "There were also minimal social guarantees: pensions, unemployment benefits, exemptions for families with many children etc. Yet people were very oppressed by universal deficit" (Bakonis, 2009, p. 138); "Living conditions in the flats were improved for most families created during the post-war years. The price of that was that a part of the society started not only to come to terms, but also to *identify with the imposed system*" (Brazauskas & Makauskas, 2004, p. 155). Finally, one more way is to treat the forms of modern life as indirect tools of Sovietization. Some authors of the 12th grade textbooks interpret such features of a modern industrial society as education and healthcare accessible to all, social guarantees and the provision of jobs and homes to everybody as only a means by which the Soviet regime attempted to "assume control of the Lithuanian society"[46] (Anušauskas et al., 2012, p. 131). The modern way of life which encompasses leisure entertainment and consumerism is seen as encouraging a conformity with the Soviet system and therefore is represented negatively in the textbooks (Anušauskas et al., 2012; Gečas et al., 2001; Kapleris et al., 2016). Modernization is paradoxically presented not as an improvement in living conditions, but as the "coming to terms with the occupation authorities"[47] (Gečas et al., 2001, p. 335).

45 A short paragraph about Soviet everyday life states: "Life became easier. But there was no freedom of action. After work people were forced to attend mandatory meetings and various events" (Litvinaitė, 2007, p. 19).

46 "Soviet authorities created good opportunities for social mobility for those layers of society who did not have necessary conditions to seek higher education or a career before. The Soviet system identified education with ideological education, therefore the number of pupils of general and professional secondary schools, of students of higher education increased rapidly" (Anušauskas et al., 2012, p. 130).

47 "Already during the times of Khrushchev, most inhabitants came to terms with the occupation authorities, their national feelings were overshadowed by the

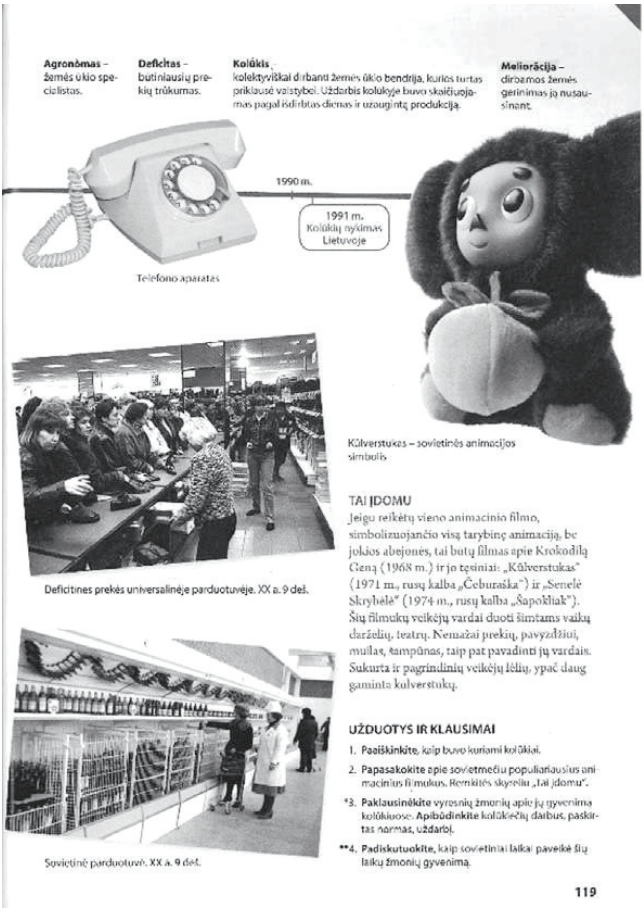


Fig. 7: Fragment of the history textbook by Petreikis, D., et al. (2014).

Images illustrating the chapters in textbooks about Soviet life tell more varied stories. They are particularly abundant in lower grade and more recent textbooks. The photographs most often showcase domestic appliances (telephones, television sets, and radios), means of transport (Zhiguli cars,

accumulation of material values" (Gečas et al., 2001, p. 335). It is necessary to point out that several textbooks for the 12th grade (Civinskas & Antanaitis, 2001; Navickas & Svarauskas, 2015) present the urban and modern life in more neutral terms.

motorbikes), new residential districts and interiors of flats, the currency (roubles), youth fashion and sports festivals. These telling details of daily life are presented together with images from Soviet demonstrations, working bees and party meetings, Soviet youth organizations (pioneers) or queues in half-empty shops. A telling example of the complexity of visual storytelling is four photographs illustrating the chapter in the 5th grade textbook on life in Soviet cities (Fig. 7). They depict a telephone, Cheburashka, a character from a Soviet animation movie (Kūlverstukas in Lithuanian, known as Topple in English translations), and two interiors of shops in one of which people crowd around the goods that were largely unavailable (Petreikis et al., 2014). Yet if visual narratives sometimes present a many-sided image of the Soviet life, the texts usually emphasize its negative aspects, such as the shortage of consumer goods, the poor quality of products, a lagging behind the West, mass alcoholism and plunder of state property. In higher grade textbooks students are sometimes asked, e.g., what are positive and negative changes that happened in Lithuania during the Soviet period. Yet often it is impossible to find an answer to the first part of the question in the text.[48]

Thus, in history textbooks, the industrial signifies first of all the development of industry and its Soviet control. The rapid growth of new industries and the construction of industrial enterprises are partially presented in a celebratory way, but a negative evaluation of industrialization as a colonial project controlled from the centre prevails. Much like the industrial museums, to industrialize and to modernize indicate here to Sovietize the society, to subjugate Lithuania ideologically to the occupation regime. In this way, the history textbooks present the story of Soviet authorities as owners of industry sidelining the role of industrial communities. The topic of work and workers is not presented at all in the stories of history textbooks about the Soviet industrial society. Although the authors discuss the question of social class, they focus mostly on the presentation of a specific Soviet class – the nomenclature.[49] Only two textbooks briefly mention the working class, which increased to around

48 As if by foreseeing this problem, the question is sometimes formulated differently: "Assess the impact of the Soviet period on Lithuanian society. Which negative aspects inherited from that period are reflected also in our time?" (Kapleris et al., 2016, p. 215).

49 Nomenclature and its privileges are discussed in chapters with such telling titles as "Some Are More Equal than Others" (Kapleris et al., 2017) or "Life Was Good Not for Everyone" (Brazauskas & Makauskas, 2004).

40 % of the Lithuanian population.[50] Some authors of textbooks encourage students to ask their parents and grandparents about life in Soviet Lithuania and also about work in industry.[51] In this way, a voice may be given to those who have lost the right to inherit their lived Soviet period. However, as Kohrs notes, the narratives of textbooks and live memory often have nothing in common (Kohrs, 2006). Talking to their family students often receive a completely different image of the Soviet life, which is more about the normal everyday life than about an active or passive resistance against the occupation, the topic that dominates the textbooks. For example, while reading textbooks, students could not understand in any way how and why nostalgia for the Soviet times appears in the stories of people from the older generation (Kohrs, 2006). The fact that the theme of industry is presented in textbooks not from the point of view of people who created it or felt its impact, but from the point of view of the authorities, only confirms this idea.

Conclusions

A widespread opinion is that the Soviet industrial heritage is a marginal area of heritage in Lithuania or is not regarded as heritageable at all (Drėmaitė, 2012; Storm, 2014). In fact, "the authorized heritage discourse" (Smith, 2006) in Lithuania does not treat Soviet industry as a valued legacy. For example, there is not a single industrial building from that period listed in the Register of Cultural Values. Despite that, there are relatively many diverse practices of memorializing and studying Soviet industry in contemporary Lithuania and one of the underlying goals of this chapter was to demonstrate this. Currently, one can see and experience Soviet industry, including the nuclear industry, in various museum projects and even assist with collecting for it. It also constitutes quite a large part of the narrative about the Soviet past in history textbooks.

Soviet industry is a clearly dissonant heritage in the sense that producers of this heritage reveal and try to maintain a binary relationship between "us" and

50 One textbook presents the particularities of the Soviet working class by claiming that "in reality workers as a group of the society were only a workforce in state factories" (Civinskas & Antanaitis, 2001, p. 201). The second textbook presents workers through the changes in the social composition of the society: "In 1960, there were around 490,000 workers in Lithuania, and in 1980, already over a million" (Navickas & Svarauskas, 2015, p. 157).

51 Mostly the authors of the 5th grade textbooks give such tasks to the students. See Litvinaitė (2007), Laužikas et al. (2008).

"them" as well as between Lithuanians and the Soviets. History textbooks tell, at the first glance, a celebratory story about high industrialization and rapid urbanization, but in the end they present this as a negative narrative about the Russification of the country and contamination of its land. Contrary to the textbooks, industrial museums tend rather to celebrate technological advances and invite their visitors to admire the greatness of the machines without any critical environmental assessment. Both museums and textbooks, however, share a negative image of modernization as a means to Sovietize Lithuanian society rather than a complex process of societal and economic change.

The heritagization of Soviet industry in Lithuania creates also an effect of a double dissonance, since it raises the issue of social class and hides it at the same time. The narratives in permanent expositions in the museums and in textbooks clearly "depopulate" the history of Soviet industry, to use Davies term (1996). The centralized development and control of industry from Moscow rather than the work and life of industrial communities prevails in the narratives in history textbooks. In the same way, turbines and reactors dominate the museum halls and industrial sites. In both cases, the heritage of industry owners is preserved and presented, as it comes, negatively or positively, once more – paradoxically – disinheriting those who worked in the industry and whose lives it formed.

The pedagogy of such a dissonant heritage is in no way a simple task. The analysis of museum displays and textbooks as educational sources has limitations because they constitute only a part of the learning process, which usually occurs through interactions during visits to museums, guided tours, teacher's work in classroom and other activities. On the other hand, the narratives they create can be understood as a foundation on which the experiences and subjectivities of learners are formed. As this research has shown, museums and history textbooks often emphasize different things in their narratives about Soviet industry. There are two important themes related to industry requiring exceptional attention: those are the environmental and social issues. The environmental issue is widely discussed in history textbooks, despite the fact that pollution is almost exclusively linked here with the Soviet type industry and not with modern industry in general, which would be more correct. Yet this theme is completely missing from museum displays and projects, thus presenting not only a partial, but also a distorted view of the industrial past and its impact on the current situation of climate change. Similarly, the social and cultural history of industry is mostly concealed in textbooks, while emerging museum practices attempt to present it. Perhaps, such different representations of these issues may be used productively in order to reveal a fuller image of the history of industry in education if it takes place both inside and outside of school.

As the chapter reveals, the nuclear energy industry performs an important role in the narratives of Soviet industry. Not only the INPP becomes a symbol of high industrialization, but, I argue, the nuclear theme introduces the importance of sensibilities into the discourse of Soviet industry. One of these, nuclear fear, may be felt both while reading the textbooks and through "museum" experiences while visiting the defunct nuclear power plant, now in the process of becoming a site of nuclear heritage. Another feeling, nostalgia, is produced by the emerging museum practices, which seek to give a voice to the former industrial communities as an important participant of the processes of industrialization and modernization. One of them is the Museum of Visaginas which collects and shows the lived experiences and memories of people whose lives were shaped by the industry. By seeking to re-actualize certain values of the industrial society, such as sociability, the museum clearly resists the aforementioned fear of post-Soviet nostalgia. Precisely by emphasizing feelings of nostalgia and fear, these narratives of the nuclear industry may become powerful tools of the dissonant heritage pedagogy, encouraging both empathy and critical thinking.

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3

Ilona Tandzegolskienė

Revisiting Educational Potential of the Industrial Heritage Tourism: Ruhr Area in Germany and Ignalina Power Plant Region in Lithuania

Abstract: The main topic of the chapter is related to the changes that took place during the historical stage of the industrial period. The changes are analysed through the preservation and revitalisation of objects, the perspective of landscape reconstruction, and the renewal of the urban city. The main keywords in the chapter are related to the preservation of industrial heritage, the meaning of historical events, the determination of the value of remembrance based on the theory of the scar, the importance of identity, and the principles of educational tourism. In this work, the case study method is applied. The underlying principles of this method allow to devise certain characteristic strategies in constructing the new face of an industrial heritage object, post-industrial landscape, or urban city. The case study discusses the example of the Ruhr area in Germany through which certain trends on how problematic and specific objects are transformed into part of the cultural heritage and places of interest are shown. The obtained results are presented in connection with the challenges posed by the closure of the Ignalina Nuclear Power Plant (INPP) and the search for the new identity in the city of Visaginas. The study report also presents elements of a sustainable and long-term industrial heritage analysis scheme including the uniqueness of the site, its significance to society, value potential, approaches to demonstrating objects based on constructivist philosophy, educational tourism, and new learning experiences.

Keywords: industrial heritage, Post-industrial landscape, Educational tourism, Learning experience, Ruhr area Germany, Ignalina power plant region, atomic town Visaginas.

Introduction

The classical conception of cultural heritage, which dominated approximately until the mid-20th century, focused on tangible and intangible objects that were maintained and developed by inheritance from older generations of the society. Capelo et al. (2011) note that such an interpretation of this conception is no longer appropriate for the current reality and invite to perceive heritage as something continuously created and recreated which comes from the past, yet has a strong interaction with the present. Therefore, the context of the

concept of heritage has expanded from architectural structures to the terrain, from nature reservations to the landscape, from ethnographic rural images to images of industrial cities, and from the demonstration of "primitive equipment" to powerful industrial giants.

The objects of industrial heritage are becoming a part of the cultural heritage today, and the revival or giving a "second life" to these objects is in many respects and interesting phenomenon. This change is associated with environmental perspectives, economic development, social and cultural revival, and empowerment of intellectual potential. Along with the main functions such as enhancing the attractiveness of a public space, assuring the structural sustainability of a city or a region, "awakening" of the creative potential of the population, or reducing the unemployment rate in the region, revival of industrial heritage sites also focuses on cherishing the intangible values such as involving museums into the preservation of the memory about the Industrial Revolution epoch. According to Alanen and Melnick (2000), museums can preserve the interaction between cultural development and industrial heritage which leads to the creation of new artistic-cognitive spaces; furthermore, the transformation elements demonstrated in the factories and plants are linked to gaining historical knowledge through education. Storm (2014 analyses the objects of industrial heritage and post-industrial landscape using the scar metaphor that encourages us not to forget this object by reliving the past in the present moment, as well as to construct the future by exposing us to the values through the process of revitalization. Hence, the revitalisation of industrial objects encourages us to investigate and document the history of the industrial revolution, to record the growing balance between the vegetation and anthropological elements in the places of landscape reconstruction, and to create a new conception of the urban image focusing on its development as a cultural, cognitive, and leisure centre. It also encaptures social change, the scale of development, the need for the transformation, the rethinking of functionality, the details of the structure, and the stages of crisis resolution. When constructing remembrance of the industrial heritage or creating post-industrial landscape spaces, the following benefits of educational tourism are notable: motivation to travel, perceive, and learn through realising urban cultural development and industrialisation through various objects and landscapes.

The main theme of this chapter is related to the changes that occurred in the period of the Industrial Revolution which lead to widespread discussions about the reconstruction of industrial heritage, post-industrial landscape, and urban revitalisation as an opportunity to raise awareness of the value of remembrance and the significance of historical events through educational tourism. The aim

of this chapter is to overview the primary changes in the industrial heritage and post-industrial landscape in relation to the need of post-industrial society to preserve and maintain this specific heritage, as well as to highlight the elements of educational tourism that underlie the principles of sustainable and long-lasting cognitive and learning process.

Consequently, the case study method, which is successfully used in social sciences, architecture, and landscape architecture planning, will be applied in the present work. In the current research, the case of Ruhr area in Germany is presented as a case where problem-causing specific objects can be identified for reconstruction to make them a part of cultural heritage. The example of the Ruhr area in Germany is expected to help highlight certain strategies relevant to the INPP region and the city of Visaginas.

Theory Part 1: Spatial and Social Changes of Industrial Heritage and (Post)-Industrial Landscape

Changes in the Conception of Heritage in the Industrialisation Period

The conception of heritage is relevant in this chapter since the object under analysis represents the challenges of the Industrial Revolution and captures the moment of preservation and remembrance. In order to understand the relevance of today's industrial heritage and post-industrial landscape to culture, education, and history, it is not enough to refer to the classic conception of this notion. Nowadays, this notion also encompasses monuments, legacy of agrarian culture, natural, cultural, and post-industrial landscape that are significant for a group or society in general, i.e. heritage becomes factories, factory sites, mines, gigantic industrial machines, and even dwellings or public spaces meant for workers (Jensen, 2000; Čepaitienė & Mikailienė, 2017). De la Torre and Mason (2002) explain heritage value as a set of positive characteristics or qualities perceived by certain individuals or groups about cultural objects or sites where these aspects are not immutable in a changing context. They highlight the right of every person to participate in history writing, emphasising heritage as having social and political implications. It is noteworthy that the conception of heritage includes both material aspects associated with monuments, artefacts, natural structures and buildings; and intangible, non-material aspects, associated with authentic lifestyle in a particular area such as customs, special skills, or abilities; national cuisine, songs, and dances (Storm, 2014; Copic & Tumaric, 2015; Čepaitienė & Mikailienė,

2017). Capelo et al. (2011) reinforce this idea by stating that heritage exists in the material physical sense as an object – a building or a landscape while at the same time these material objects are given meaning through memories, dispositions, or imagination. This conception has been considerably developed in recent decades and has expanded from individual to urban architectural structures, from industrial contexts to the natural ecosystem and landscape; consequently, the significance of heritage and cultural value has increased.

With such a broad understanding of heritage, difficulties arise in the definition of the object and the separation and evaluation of the aspects of the classification which are related to geographical, chronological, and typological elements of value. Alexander (2010) and Storm (2014) note that the initial perception of heritage is equated with the conscious desire of our predecessors to tell us something and to leave us something as an important phenomenon or an object. However, this definition is increasingly used when seeking to focus on a particular gift or even oppositely – a burden (we proudly carry it in the case of a gift or quietly bear it in the case of a burden), so that we can "leave" it for the future generations. Storm (2014) also maintains that it is becoming increasingly hard to clearly define a heritage object due to the difficulty to define and capture logical links between human experience and physical artefacts. The author (ibid.) emphasises that heritage is ever-changing and seen as an activity or a process which is more focused on intangible things, such as authenticity, identity, and artistic or technological uniqueness. Bearing this in mind, heritage is constantly being redefined in relation to the context of the area, the history being told, the value system, and current changes. Thus, it is important to talk about heritage in the context of the values and attitudes of the current population while not forgetting unrelenting aspect of the value of identity. Interestingly, the concept of heritage, which is recorded in historical documents of the epoch, preserved in drawings, presented through narratives, or illustrated in photographs and immortalised in artistic projects, is also identified with something positive; namely, it is enriching people's lives in that to some extent it is partially offering some sense of immortality, Similarly to Storm (2014) Neittleingham (2018) refers to the moment of restoration and revitalisation of the heritage object as a time "scar". While these objects become immortalised and associated with longer publicity, the primary purpose of the objects is destroyed and the identity value is altered. It is noteworthy that certain "unwanted heritage" or even "dark" heritage exists which narrates conflicting situations and memories related to the "victim-offender" or "powerful-powerless" relationships.

Therefore, when presenting the philosophical approach to the conception of heritage, several conceptions are distinguished. One of them is the essentialist conception of heritage which underlines the natural and innate value of an object. Another is the "humanist view" which emphasises the universal, transcendental, objective, and unconditional characteristics of heritage. Finally, the constructivist approach is based on the premise that the identity lies not in things but rather in relations, and it is social relationships and modern values that determine the identity of cultural and social objects while clarifying the significance of the past in the present time (Alexander, 2010).

Active analysis of industrial heritage objects started around 1960–1970, when the focus was on the achievements of technological processes, accumulated experience of the local community, and stories told by workers. Built in the 19th century, industrial heritage buildings with large windows mostly built close to the sea or lake or in urban areas are now reconstructed into restaurants, schools, exhibition halls, museums, and places for cultural events. However, there is also talk about the scars of the ruined post-industrial landscape of the 20th century such as abandoned factory complexes, shutdown power plants, monolithic buildings, and workers' canteens with broken windows.

Furthermore, the new conception of economic utility and sustainability has led governments to reconsider the cultural and historical value of these forgotten objects that have lost their functionality and devastated landscapes. Thus, the re-adaptation of industrial heritage buildings and the post-industrial landscape to modern needs has recently become of interest. The redesigned living environment and the uniqueness of the objects are apparent in such design solutions as preserved authentic and visible steel girders, plastered walls, original and wide windowsills, and open spaces. Many famous projects such as Bankside Power Station in London, opened in 2000 as an art museum (Art Museum – Tate Modern), or lofts in the former mill in Gothenburg in Sweden are perfect examples and design solutions of the industrial past. Industrial heritage objects due to their contrasting appearance with creatively managed landscape attract new residents or new visitors, and in turn not only start serving modern life but are also associated with financial prosperity.

Nowadays, industrial heritage raises a great deal of interest due to its exotic otherness and creates an aura of mysticism and romance. The number of abandoned, obsolete, and unused post-industrial infrastructure sites and industrial heritage objects testifies how the industrial revolution has encouraged mankind to move towards new technologies and technological advances neglecting the agricultural economy. It means that the true purpose of the

land is changing towards the idea that land is a place where one can absorb "resources" and "take" what humanity needs. These objects, structures, and landscapes that bear witness to the industrial and technological past have acquired a certain cultural, social, and historical value both at the regional and the urban scale. In this case, industrial heritage includes waterpower, river navigation canals, locks, mills, gasworks, post-industrial sites, warehouses, railways and stations, harbours, or mining sites (Krinke, 2001; Alexander, 2010; Sutestad & Mosler, 2016).

It is noteworthy that "industrial ruins" were not immediately perceived as beautiful or highly valued heritage objects since they were associated with excessive consumption of resources and urbanisation in the industrialisation period and reminded of devastating or even dangerous places. In terms of heritage value, such places or objects are often too stigmatising to be included as relevant and valuable points of interest (Loures, 2008; Alexander, 2010; Storm, 2014). Loures (2008) and Loures, et al. (2017) maintain that a negative public perception of objects created during the Industrial Revolution still exists even if they are no longer functional and their origins are no longer in line with the contemporary aesthetic, ecological, and value-based conceptions.

According to Storm (2014), nuclear power plants with closed reactors and damaged landscapes can also be added to the industrial heritage list, such as the nuclear power plants at Ågesta in Sweden, Calder Hall nuclear power plant in England, INPP in Lithuania and which are currently closed and being dismantled. However, these types of objects attract visitors because of the "nuclear fear" and sense of danger or because of the utopian signs of the past.

Some authors (Copic & Tumaric, 2015) claim that the analysis of industrial heritage and identification of (post)-industrial sites was initially only of interest to "amateurs" and "enthusiasts," yet today it has become an interesting topic widely investigated by various researchers in sciences and arts. Not only is the historical, technological, social and architectural value, but also the scientific, creative, and educational value of these objects is actively discussed (Loures, 2008; Alexander, 2010; Storm, 2014). Mason and Avrami (2000) and Loures (2016) also invite to take a broader look at this phenomenon either from the ecological or educational point of view referring to the relevance of its social, cultural, and economic value. Meanwhile, Copic and Tumaric (2015) recommend analysing the historical and architectural uniqueness of these objects and landscapes as the interest in these areas is continuously growing.

The Use of Scar Metaphor in Defining the Relevance of Heritage

When analysing the sites of (post)-industrial landscape, Storm (2014) employs the leitmotif of "scars" and distinguishes three categories of industrial heritage: the first one is related to the canonised understanding of heritage scars where the place used for industrial purposes is redefined and reused in setting its new goal; the second one is referred to the ruined post-industrial landscape scars which are associated with abandoned, collapsing, or unused places that are simultaneously considered romantic and disgraceful; and the third category underlines undefined post-industrial landscape scars which are not considered significant to be remembered or preserved. Storm (2014, 8) notes: "<. . .the idea of the scar challenges understandings of heritage as regards the relationship between the mental and the physical. A scar is something you live with. It is a bodily experience, a physical memory. If shown, it is also evocative and can trigger narration: Where did you get that one? <. . .> A scar, on the other hand, is an organic metaphor. It is not a tool for human beings, but an integrated part of human experience."

There is more to be gained from this description of the conception than from predefined categories. Remembrance, in this case, requires consolidation, whereas the scar metaphor becomes a conceptual tool for holding and protecting memories. Scar, wound, and other organic metaphors used to define heritage are used to show large-scale transformations that have been associated with gigantic constructions and painful changes in the landscape or a terrain (e.g. construction of hydroelectric or gigantic factories). From the point of view of industrial heritage, the use of the scar metaphor also implies the perception that well-being is inevitably costly. It requires a "sacrifice" as industrial growth and the desire to live better alter the image of a location, ruin and devastate nature. The scar does not disappear anywhere. It is present, yet it can be shaded, hidden, or consciously forgotten.

However, according to some authors (Loures et al., 2017), visual value has a stronger impact when assessing the (post)-industrial landscapes and industrial heritage objects, whereas historical remembrance is not always preserved, i.e., historical amnesia occurs. This is due to the fact that fit-for-new life and domesticated industrial objects and landscapes have often been restored and rearranged by those who do not have a personalised memory of the area or the object. Consequently, the historical remembrance and identifying memories of such areas have been lost. In fact, many (post)-industrial landscapes

and industrial heritage objects simply disappear or are "destroyed", which can be referred to as a scar because the identity of those who lived and worked in that place is simultaneously destroyed. One could talk about the connectedness with the place and the community that lived there since the significance of identity depends on social interaction and constant dialogue with others (Bairašauskienė, 2018).

Meier and Aytekin (2019) have conducted 222 open-ended interviews in six regions of Europe noting that there is a sense of nostalgia for the past among the people who have lived and worked in an altered industrial landscape. This is manifested through the perception that their jobs have been destroyed, and their sacrifice will no longer be appreciated by anyone. Both the pointlessness of the former work process and the hope for the new investments, which are linked to the opportunities of revitalisation, are visible. Consequently, people living in such place begin to look at the process of change from a distance, with a certain detachment, which is called a panoramic view. In turn, panoramic view requires both physical and emotional distance which leads to the reflection on the object/location and the search for a new self. Historically, the transformations of industrial cities, industrial sites, and post-industrial landscapes in the US and the UK have taken place by altering their use and investing in new and spacious residential dwellings, replanted and scenic landscapes, or planning and installing museum spaces, art galleries, and leisure and entertainment areas.

Meanwhile, the demolition of industrial complexes and the devastation of landscapes in Eastern Europe have freed quite a number of cities and locations from the utopian rhetoric of the Soviet heritage, yet this has also posed a new question: "How could new non-utopian spaces be created from objects that represented the pride, industrial growth, and high self-esteem of people who worked and lived there?" According to Drėmaitė (2002), there is a lot of debate in Lithuania about the industrial legacy of the Soviet period not only in the psychological sense when talking about foreign workers who arrived, low quality production, poor organisation, non-ecological conditions, and hard work, but also because of the emergence of uncharacteristic to Lithuania unified architecture. This period is considered a negative experience and is referred to as the scar that is not consciously analysed or remembered. This is tantamount to an irreversible historical loss of remembrance where cameras and photographs are unable to capture and preserve the existing memory since the buildings and memories have been destroyed.

Another important aspect is that the focus is often given to an individual building rather than to the landscape and environment as potential heritage. In this case, the natural surface of the land and the buildings located there, as well as the particularity of the region, results in the proposition how to strategically plan the presentation of the object, covering both the uniqueness of the buildings and the landscape. Such thinking could enhance the creative potential, the design, and strategic planning capabilities of the region seeking to protect the historical remembrance of the Industrial Revolution. The genre of photography is introduced as an appropriate means of conveying information that helps to capture the decline of material assets and the restoration of nature in those places. The romanticisation of industrial heritage and the environment acquires a different outlook through photography, where the moments and changes of the past are captured by technology. Everyday routines and a gaze into a daily life of a working person dominate in the photographs, hence conveying the life and story of the working people. This genre suggests a new idea that the daily life and "injustices" of the past and present are hidden in the museums and restored industrial heritage objects, photo reports, or films in order to avoid the discussions about uncomfortable things.

However, some artists and photographers purposefully try to bring back the image of the labourer to the landscape or industrial heritage objects in order to create a visual illusion of a working person. To summarise, the discussion focuses more on the breakdown between the material things and location: the importance of the tools they hold, the machines they operate, or the living environment that represents the fragments of their home life is valuable only as long as the living place is used, worked on, and lived in (Meier & Aytekin, 2019). Dortmund Zollern Colliery can serve as an example because its remembrance is associated with natural resilience and hard-working but proud people. The scar here is perceived through the simplification and redefinition of the hard work of a labourer in the mines and the suppression of work problems by the architectural evaluation of the area. In this case, the identity in photographs and installations is strengthened by emphasising local authenticity, storytelling, and the preservation of the working culture.

Another reason for the existence of the scar could be named – the invisibility and uncertainty of industrial heritage objects, which may be due to their remote location or perception as unimportant. This can be exemplified by the city of Visaginas and the INPP since these objects have neither a clear definition nor cultural value and currently are more imaginable and implicit. The decommissioning of the first reactor at the INPP in 2004 and the second

one in 2009 had a major impact on the fate of the city since the majority of the city's population worked in the plant, and the city itself was built to service the nuclear plant (Šliavaitė, 2010). Hence, it has become inconspicuous as to what the purpose of the city and the surrounding landscape around the closing INPP should be today, and what value should be attributed to it. At the moment, it is difficult to associate it with recreational zones and eco-tourism.

Therefore, the time perspective also determines the prospects of revitalisation and re-use since industrial heritage objects and the ruined landscape are identified as scars of uncertainty. Since they are left in an uncertain position, it is difficult to remember their past but also foresee the future. Hereby, both tactical and visual perceptions of the perspectives of the object and the location remain unclear and sink into "oblivion". This can be attributed to the Lithuanian industrial period which is perceived as obscure and devastating to the unique nature of the country and at the same time identified with a particular negative experience at a certain historical period, namely, the Soviet times. Hence, the heritage and landscape of the industrialisation period can hardly find their way to the construction of Lithuania's historical narrative and national identity since the heritage of mansions and industrial objects of interwar Lithuania are more precious to Lithuanians (Drėmaitė, 2002).

In addition to the records in the historical sources that may help understand the impact of industrial heritage at the regional and national level, it is also important to talk about the social context which includes the sources of the society's culture and way of life. This may explain the underlying causes of industrial growth and changes in people's lives that have led to this particular type of change, as well as structural, economic, and social changes. Due to the negative experiences, this historical stage in the country (Lithuania) is not actively researched and described. Nevertheless, material objects, such as archival data, buildings, locations or landscapes, and intangible objects, such as workers' stories, lifestyles, or folklore of that period, may answer the question asked a little earlier about creating new non-utopian spaces and identifying the value of industrial heritage. It is notable that the restoration and preservation of identity is possible through sharing the narrative, where nostalgic memories of the past and community involvement in preserving the historical value can help create a historical moment of this remembrance. Nostalgia is not the only element of the narrative that revives identity – sadness and indifference can also become the narrative storyline of identity restoration.

The Trends of Urban Change Dependent on Industrial Heritage Objects or Post-Industrial Landscape

In addition to gigantic buildings and landscapes, urban spaces are often considered as objects of industrial heritage, and tourism is a powerful tool to inspire their reconstruction and conservation. Murphy and Boyle (2005) agree that culture has "become" a part of the strategy of numerous cities where tourism is developed. Analysing relevant case studies, a lot of cities across the UK (Glasgow, Liverpool, Newcastle and Birmingham) and other countries (Antwerp, Bilbao, Genoa, Rotterdam) have been identified as cultural cities. This idea marks a radical development of the concept of "culture" and contributes to educational tourism, heritage, and entertainment (Murphy & Boyle, 2005; Ismailova et al., 2015; Copic & Tumaric, 2015). The urban tourism strategy and the related issues including the purpose, scale, pace, and appropriate impact of the change on the region/locality and policy encourage the creation of a new product that attracts domestic investment, and thereby, demonstrate the economic growth of the city/area. It is worth noting that tourism oriented towards the development of cultural values has become a major theme of international tourism and became an important focus in the reconstruction of urban areas. According to some authors (Murphy & Boyle, 2005), it is highly significant that the development of industrial heritage objects and urban tourism has been linked to the economic and educational goals. Consequently, it leads to raising investment and revitalisation of urban areas. As Meethan (1996) notes that cities "took advantage of cultural capital" title because it saved closed factory buildings and unused areas from demolition and turned them into tourist and educational attractions while developing services sector.

Murphy and Boyle (2005) analyse cities that symbolise and demonstrate how industrial cities can change, such as Glasgow, Bilbao, Newcastle, Rotterdam, Porto, and introduce a conceptual model of the post-industrial city. The authors (ibid.) further draw attention to the tendencies of the development of tourism culture in these cities emerging from the need for tourist accommodation services, development of leisure and retail services, creation of attractive heritage, revival of forgotten and neglected places, and the organisation of festivals and other cultural events. When the support was received from politicians and the new initiative was strongly supported by the local community, the cities of Liverpool and Bristol have become as an example to follow. The ethnographic study conducted by Meier and

Aytekin (2019) demonstrated that social identity and community building of the local people is just as important for the transformation of industrial objects. This reveals the importance of the political decisions that promote urban development and economic growth, attraction of private investors, collaboration of public and private sectors, local government involvement, and the community support for the conception. Moreover, great importance is attached to the creation of new attractions, to the enhancement of the attractiveness of information/tourism centres, to the search for marketing solutions, wellness and leisure centres, to the analysis of possibilities for more museums and gallery facilities, to the thematic prerequisites for organisation of festivals and other events, and to the promotion of retail sales and real-estate development. Special emphasis is placed on the need for individuality in urban change and development since a successful beach revitalisation, organisation of festivals, or construction of a conference centre may not always be justified. Therefore, it is suggested that project development should help preserve something that is unique and specific to the area while remembering cultural signification avoiding "uniformity and recurrence" in other cities (Alexander, 2010; Murhpy & Boyle, 2005; Rodríguez-Ferrándiz, 2014; Ismailova et al., 2015).

In summing up the first part, it may be concluded that industrialisation objects testify to the industrial development, urban, or even regional development, and therefore have an indispensable historical value in several respects, such as: (1) it is a typical and important proof of industrial development and industrialisation processes; (2) it tells about social identity and belonging to the community, and it shows the daily work of a working person signifying his/her social value; (3) it has technological and scientific value in terms of production, engineering, engineering, architecture, and planning; (4) it can have a high aesthetic value for the quality of architecture, design, and planning, which may become an inspiration in the future from the creative point of view; (5) it is a unique intangible heritage that can be recorded in archives, through experience, through elements of the industrial landscape, industrial machinery and even their layout in the room, and through urban spaces in which they exist; (6) authenticity, as the survival of specific object typologies or landscapes, adds special value and should be carefully assessed and preserved. The first three subthemes of the theoretical part can be summarised in one figure (see Fig. 1) which demonstrates the process of objects' analysis and the most important stages of transformation.

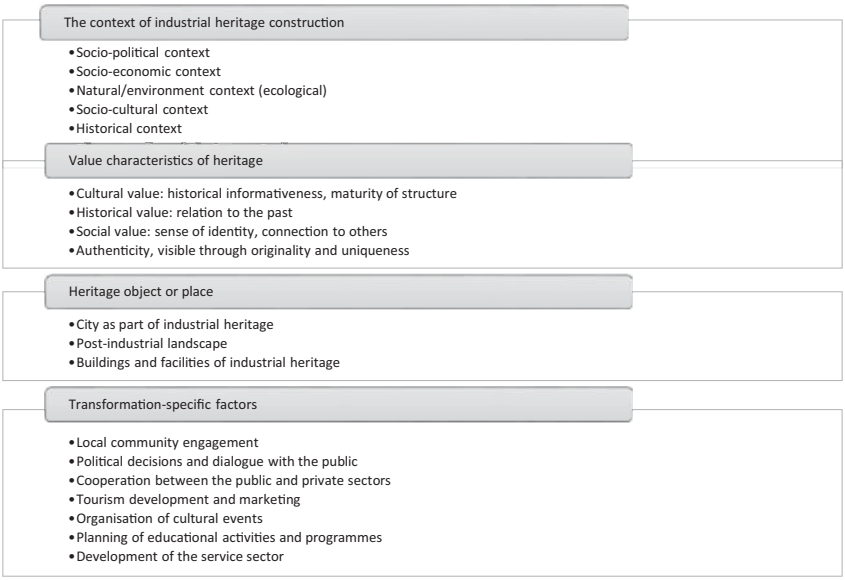

Fig. 1: Process and analysis of industrial heritage construction (compiled by I. Tandzegolskienė)

Theory Part 2: The Possibility of Transformative-Experiential Learning Developed within Educational Tourism When Interacting with the Objects of Industrialisation Process

A modern tourist chooses the goal and type of the travel not only seeking to flee or escape from something, but also in search of intrinsic motivation that incorporates self-awareness and the need to gain new experience. While discussing the objects of industrial heritage, there are three most frequently distinguished conceptions: industrial tourism, post-industrial tourism, and industrial objects of cultural tourism. For instance, Szromek and Herman (2019) distinguish between industrial and post-industrial tourism. The former is concerned with tourism related to the cognition of the operating industrial companies through educational programmes developed by the companies, while the latter is associated with travelling to places where production has been terminated. However, both terms are frequently used as synonyms simply meaning – trips to the objects and places of industrial heritage. These can refer to museums, parks, or other infrastructural objects which involve and

motivate by their authenticity and give a possibility to understand and analyse the location by employing the accumulated historical legacy and heritage. They perform the function of exhibition rather than production. When defining educational tourism, not only industrial places but also cultural objects and nature objects are included.

Therefore, some authors (Rithie et al., 2003; Richards, 2011; Akabakar et al., 2014; McGladdery & Lubbe, 2017; Harazneh et al., 2018) propose expanding the conception of industrial tourism by referring to it as a transformative experience that is acquired while learning in a unique place or environment. In the field of educational tourism, Smith (2006) expresses an idea that heritage is more intangible. Even though tangible objects and places can be identified as heritage, it is more relevant to talk about the act of remembrance related to the present, the meaning of experience here and now, whereas the places and objects themselves are historical and cultural means that can help you understand and master it. It shows that trying to understand the value of an object or a locality, it is important to invite tourists/visitors to feel and experience what is significant. Storm (2014) notes that when an industrial heritage object or a post-industrial landscape is presented, people mainly interpret it through "seeing" and "feeling". In this way, a tourist/visitor is guided by the aesthetic criteria of cognising the history or the place, where the eyes and the "re-absorption of experience" become very important. It is also confirmed by the idea of sociologist Urry (1995) that heritage objects or places under analysis attract tourists and visitors because they can experience the place.

All of the provided examples show that scientific literature presents different definitions of educational tourism. Richards (2011) claims that educational tourism is a consequence of cultural tourism fragmentation, and today educational tourism is a separate niche having nothing to do with volunteering, language teaching, or creative tourism. Ankomah and Larson (2000) maintain that educational tourism consists of the following sub-types: cultural tourism, historical tourism, eco-tourism, rural tourism, heritage tourism, and student exchanges between educational programmes. Ritchie et al. (2003) provide a conception of educational tourism that covers an anthropological perspective based on motivation factors and dependent on the age group of tourists. According to the author (ibid.), educational tourism is best defined by a combination of these two words "willingness to learn". Following this conception, acquisition can become a primary or a secondary motivator to travel depending on how the learning process occurs – formally (using the services of an expert or a guide) or non-formally (autonomously or as a result of intrinsic motivation). The author proposes sub-segments of educational tourism, such as educational

tourism of adults and seniors, school and university/college students; he also mentions motivation problems, the impact of educational tourism, and the necessity of regional development. Meanwhile, Sharma (2015) focuses on the topics that can be developed depending on the region and defined as subtypes of educational tourism: historical tourism, heritage tourism, archaeological tourism, wildlife tourism, sports tourism, farm/agro tourism, pilgrimage tourism, rural tourism, eco-tourism, cultural tourism, culinary tourism, film tourism. Yet another conception comes from Sie, Patterson and Pegg (2016:108) who distinguish three characteristic features in their definition of educational tourism: "It (1) is an organised trip that provides choices for self-directed learning; (2) leisure travel with an expert-led educational element; and (3) is a trip where intrinsically motivated and like-minded travellers contribute to authentic and personal experiences."

The provided main definitions of educational tourism presuppose that a unified definition of the concept itself does not exist, yet some tendencies can be identified: the need for thoughtful travel planning, learning, and reflection; a motivated choice of an object or place associated with formal or non-formal education and the age group; and authentic and individually created experiences.

Analysing the conception of educational tourism, considerable attention is given to the discussion of motivation. Abukabar et al. (2014) provide Cohen's conception formed in 1972, according to which tourists are divided into two subgroups by employing various expressions of motivation: the explorer and the drifter or the individual and mass tourist. The explorer and the drifter seek new experiences and novelty, while the individual or the mass tourist seek acquaintance or in other words familiarity. This is also associated with the possibility to travel to nearby regions, for instance, within 24 hours, or go on more distant trips in one's own country or abroad (up to one month) including international exchange travels to another country for several months or semesters (Maga & Nicolau, 2018). Based on the set goals, this chapter will focus on the aspiration to learn to acquire new experience while travelling and visiting heritage objects raised in the period of industrial revolution, whereas the themes of international exchange and studies will not be expanded. Rehberg (2005) expanded the division of groups of motivating factors by adding such ones as "achieving something positive", "quest for the new", and "quest for oneself". The first group puts more emphasis on ethical values; the second focuses on friends, culture, and new experience; and the third one is more concerned with personal interests and motives, mainly professional, career, or intellectual purposes.

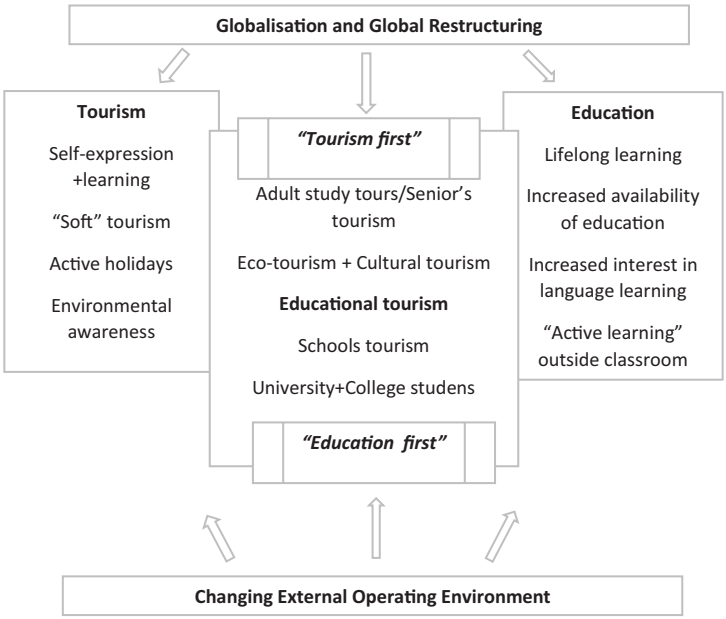

Fig. 2: Model of educational tourism (McGladdery & Lubbe, 2017, p. 321)

McGladdery and Lubbe (2017) emphasise the significance of educational tourism and discuss the duality of motivation to act, which is manifested through interaction "tourism first" and through "education first" and provide the touch points of this interaction (see Fig. 2).

In discussing the provided figure, it is possible to claim that tourism and education are closely interrelated when one plans to learn and explore while travelling, or when one intends to travel striving for new knowledge and experiences. For example, senior tourists are motivated to travel as the first component of an activity (Tourism First) which is associated with the desire to know, travel, and learn. Meanwhile, teachers that organise trips for students would consider education as the first component (Education First) although the students may associate such trips with travelling, pleasant experience, and learning outside school. According to Ritche et al. (2003), such tourism is related to rewarding, enriching, adventurous, and learning experience. Assessing the distinguished trends "Education First" and "Tourism First", it is assumed that in the first case the focus is placed on the curriculum and learning objectives at school, whereas the learning process itself is pre-planned and systemised. In the latter case, the

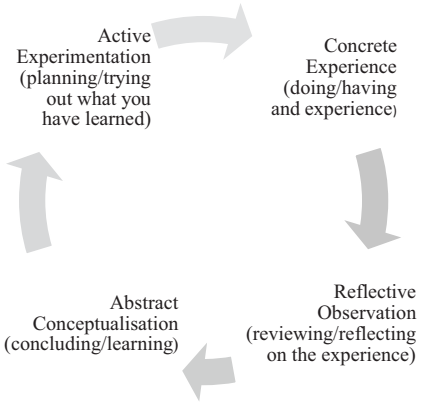

Fig. 3: Process of learning (McLeod, 2017)

focus is on visiting selected places, where the proposed non-formal learning programme is employed, yet its main motive is related to personal purposes rather than the intrinsic aspiration of a tourist/visitor to learn and discover. It shows that educational tourism is associated with learning goals, curriculum, and learning through experience and experimentation, including active engagement of students (Stone & Petrick, 2013; McGladdert & Lubbe, 2017; Harazneh et al., 2018, Nettleingham, 2018). In their study, Pitman et al. (2010, 223) highlighted three key ideas about the form of learning in educational tourism: "First, it was intentional, such as 'taking a trip specifically to broaden my horizons or enhance my knowledge.' Second, it was experiential, involving notions of 'immersion', 'hands-on', 'vivid' and 'evidence' and described as 'engaging with ideas in their original context.' Third, it was structured, such as one male academic's description of 'the combination of travel with a structured educational program."

When discussing the acquired experience in the process of learning via educational tourism, the model of experiential learning developed by Kolb (Pitman et al., 2010; McLeod, 2017; Dorfsman & Horenczyk, 2018) discloses the way how the participants of educational tourism learn. The four levels of learning (experience, reflection, concluding and practice) enable a tourist to create unique knowledge and reconstruct the acquired experience by supplementing it with new knowledge and skills (see Fig. 3). The main aspect of the Kolb's model of experiential learning is reflection which is an essential condition to achieve learning through experimentation and to acquire learning experience.

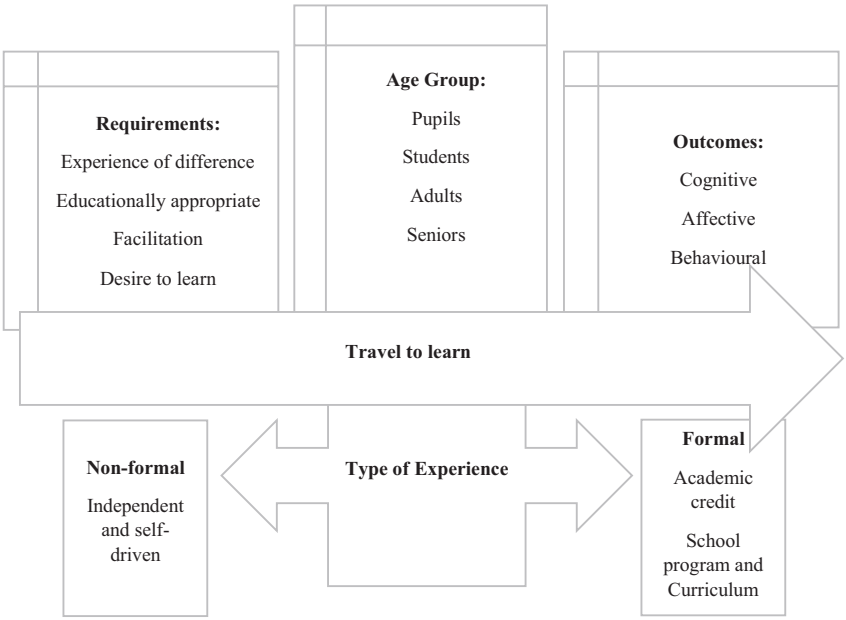

Fig. 4: A learning process model of educational tourism (adapted from McGladdery & Lubbe, 2017: 324)

In presenting the conception of experiential learning and integrating it into the process of educational tourism cognition, it is important to clearly identify the stages of learning and learning outcomes. In this case, the advantage of the outcomes is that they are measurable, and thus, can be verified and modified. McGladdery (2016: 84) distinguishes three categories within the presentation of the process of educational tourism (see Fig. 4): (1) Cognitive outcomes – measure what is to be learnt (knowledge acquired). (2) Affective outcomes – measure attitudes or ways of thinking that may change. (3) Behavioural outcomes – measure skills that will be developed.

Sharma (2015) notes that environmental factors are especially significant in creating an appropriate learning atmosphere via the consolidation of personal experience and knowledge, education examples, and a possibility to try out and get involved into the learning process. The environment with an abundance of direct distractors such as plants, animals, equipment and giant machinery, laboratory equipment, museum exhibits and artefacts activates thinking and

encourages learning through observation, comparison, inquiry, classification, analysis, and experimentation. The model introduces the potential age groups of tourists, thus partly predefining the intended results of a selected travel or programme (Ritche et al., 2003; Vangas-Sánchez et al., 2009). For higher efficiency, it is important to make the tourist see and understand the difference between the experience of everyday reality and the newly created experience during the trip that is largely associated with motivation; a comprehensive discussion about the learning object; drawing conclusions, explaining the process, and creating rules/theories; and trying out and personally outliving the newly constructed experience.

Speaking about children and students, it is understandable that motivation and willingness to learn are not always a given priority; therefore, particular attention is allotted to the teacher or trip/education guide or leader. In this case, children and students broaden their knowledge in different fields important for learning at school or university/college studies, such as project preparation or group work; planning and implementation of experiments; nature preservation and sustainable consumption; interest in culture, history, and nature; and finally, interest in science and research. Moreover, it is important to remember that the goals of formal and non-formal education, as well as the elements of the learning process, are not identical.

As far as the goals of non-formal education are concerned, educational tourism should focus on constructing personal knowledge and experience while travelling and getting familiarised with objects and places. Meanwhile, formal education is more associated with the credit system, curriculum, and education content goals. Learning methods largely differ in the process of formal and non-formal education.

Different authors emphasise that it is highly important to combine nature and experience of the activity. Since education is largely associated with constructivism, it should embrace both formal and non-formal education, thus promoting continuous learning in an educational establishment, learning outside school, and using technologies in the learning process. In the process of educational tourism, organisation, and cognition, the most frequently applied learning methods are the ones that encourage engagement through active participation and application of transformative learning principles (Pitman et al., 2010; Dobrila, Sladjana & Maja, 2018; Dorfsman & Horenczyk, 2018):

- In formal education, the proposed methods include: regular lessons (preschools, schools and universities), thematic days, integrated thematic days, projects, ecological fieldwork, extra-curricular activities, study visits, research camps, summer and winter holidays research laboratory, visiting scholars, academic research programmes.
- In non-formal education, the proposed methods are: workshops (art, science, education, sport, psychology), conferences, study tours, sports and recreation activities, environment and humanitarian action, projects by NGOs, local community projects, education projects.

It shows that the content of educational tourism is clearly defined by focusing on the age group, the set goals, measurable results, or on the planned route/education topic, and the industry branch/objects of industrial heritage and the landscape are means for implementing the planned curriculum (McGladdery & Lubbe, 2017; Dobrila et al., 2018).

Alongside with the demand for learning and engagement, primary and secondary elements of the engagement into the learning process and experiencing are identified: the primary ones include culture and industrialisation objects, events, festivals, physical, social and cultural meeting points (heritage objects, museums, monuments, parks, zoos, laboratories, reservations, objects of archaeological excavations), and the secondary ones cover places meant for recreation (film spots, theatre, outdoor workshops, exhibitions, festivals, concerts, play like historical narratives). In this case, a tourist/visitor generally takes interest in the historical narrative of the place, the "reconstructed" industrial cities, waterfront developments, arts expression of the place, shopping and nightlife possibilities, convenient destination, and safe car parking (Murphy and Boyle, 2005). It should be taken into consideration that today the tourist is educated, has developed skills of analytical thinking, gets higher income, demonstrates exceptional interest in the visited site or object, and has a stronger connection with the visited location (McGladdery & Lubbe, 2017; Szromek & Herman, 2019).

Therefore, it is possible to claim that when trying to analyse the elements of educational tourism associated with heritage objects, it is difficult to define a clearly unified set of criteria encouraging the cognition and engagement in the learning process. Therefore, some authors (Murphy and Boyle, 2005; Vangas-Sánchez et al., 2009; Storm, 2014; Sharma, 2015; Loures, 2016) propose choosing an appropriate set from the available evaluation elements that would comply with the general conception of researchers and process organisers (see Fig. 5).

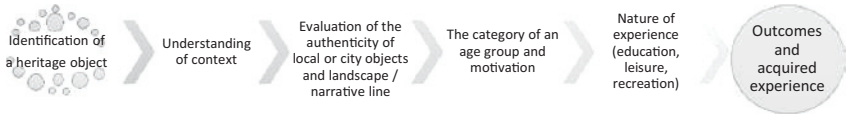

Fig. 5: Elements of analysing sustainable and long-term heritage including educational tourism (adapted from Murphy & Boyle, 2005; Vangas-Sánchez et al., 2009; Storm, 2014; Sharma, 2015; Loures, 2016; Sutestad & Mosler, 2016)

In summing up this section, it should be noted that the main goal of educational tourism is to direct people towards self-dependent learning, which depending on the age group, encourages the selection of a deliberate object or location to be explored and to seek not only knowledge, but also new experience based on personal motivation and personal experience. The new experience and new knowledge are constructed on the basis of the educational programme or the activity proposed by an educator/expert. Educational tourism gives a possibility to acquire new experience interacting with the real world outside school, or to create a space for unpredictability, experimentation, and real-time problem solving while travelling and exploring a place, object, or landscape.

Methodology Part 3: Presentation of the Research Method of Case Study

In order to understand and evaluate the changing locations and industrial cities affected by industrialisation, this study aims to answer the following questions based on the case of Ruhr area in Germany: how have the objects changed? What are the reasons for the change? What processes indicate that the transformation is taking place? In addition, the research aims to highlight the importance of educational tourism in newly revived industrial objects. The research data are presented using the descriptive type of a case study (Yin, 2003; Baxter & Jack, 2008), and focuses on the description of the area and objects, as well as identification of the changes (see Fig. 6).

The research begins with literature analysis that highlights the key aspects relevant to the review and analysis of places affected by industrialisation in relation to educational tourism. Authentic and unique objects in the Ruhr area in Germany were selected and visited by the author of the study from late January to early February 2019, namely, the Landschaftspark DuisburgNord in Duisburg, Zollern Colliery in Dortmund; World Heritage Site Zollverein Coal Mine Industrial Complex and Ruhr Museum in Essen; German Mining

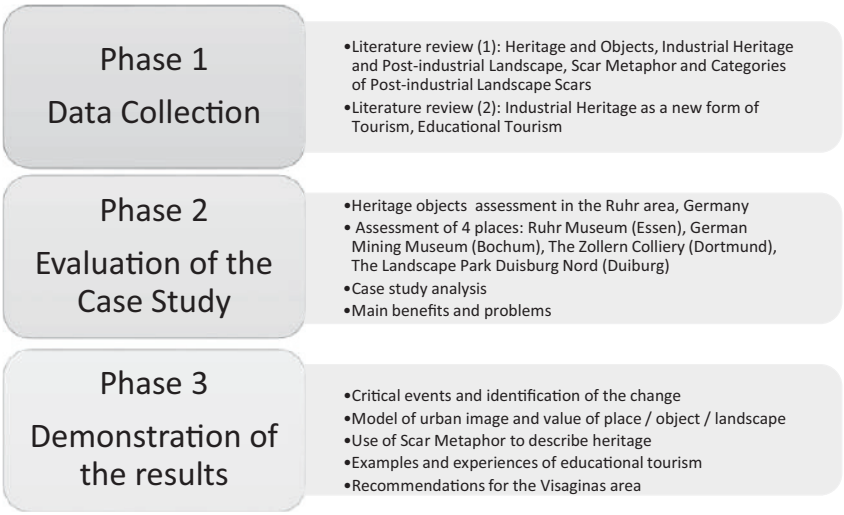

Fig. 6: Methodological diagram (Capelo et al., 2011; Loures et al., 2017)

Museum in Bochum. Relevant information about the objects and the city, the transformation process, and changes were transcribed according to the above-mentioned aspects during the trip. Furthermore, the case study focuses on critical events that inspired the need for change, the nature of development, the distinctive features of the city and objects that were to be replaced, and emotions and experiences of educational tourism.

The Ruhr area in Germany is one of the most representative projects concerning industrial objects adapted to cultural spaces and recreational areas. This is a good example of sustainable development since tourism in this region serves as a tool for the revitalisation of the industrial heritage and landscape conservation. The areas of coal mines and factories have been transformed into galleries, museums, music spaces, recreational areas, and green sustainable spaces. The former industrial region has changed its image and become an important tourist destination with an emphasis on culture and educational tourism. The transformation of the Ruhr area in Germany through industrial heritage and educational tourism is presented as an ERIH project (European Route of Industrial Heritage). The aim of this project is to create a brand of industrial heritage tourism that could be used across Europe. Certain aspects of the German experience could be applied in similar zones or regions, such as the INPP and Visaginas Nuclear City.

Part 4. Presentation of the Research: The Case of the Ruhr Area Transformation in Germany

The Ruhr area is famous for its huge coal deposits and industrial history of coal mining and steel production. However, by the end of 1950, the coal mining industry was hit by the crisis and due to the increasing competition from the gas and oil industries, a wave of closures of coal mines and coal refineries broke out. Shortly afterwards (early 1970s), there was a crisis in oil industry which also hit the region hard. These events can be referred to as the critical events that led to a recession and a wave of closures. Of the nearly 200 mines in operation at the beginning of the century, this number fell to 125 in 1960 and plummeted to 29 in 1980. The number of workers in the mines decreased 50 percent from 1960 to 1980. The Ruhr area was referred to as a "giant" dying due to the unattractive physical space, social problems, negative image, soil contamination, mass unemployment, and limited opportunities to be reemployed in another sector of the labour market. In general, this region symbolised an economic recession.

Consequently, both politicians and business representatives understood the complexity of the situation and agreed that the change was needed. In this case, it is pertinent to mention that the re-structuring programme started (1989–1990) upon the call from the Ministry of Urban Development, Housing and Transport in the North Rhine Westphalia and targeted all sectors encouraging the submission of various restructuring project proposals. It is noteworthy that the decision to develop a new joint project for the revitalisation of the region consisting of many individual projects was advantageous in that different participants could express their ideas and present their visions. In general, the programme was initially based on the 80-kilometre landscape park along the Emscher River. At the time of the German reunification in 1990, this region was not the weakest part, but the programme was not fully operational, and there were over eight thousand hectares of abandoned industrial land in the region. In fact, this was a large area that could not easily be transformed into new types of spaces or parks as it obviously required huge funds and a well-thought conception (Storm, 2014).

Today, the Ruhr area consists of a 400-kilometre stretch of "Industrial and Cultural Heritage Route". The main goal of this immense decision was to connect the abandoned places by implementing three ideas that led to change and problem solving, namely, industrial nature, industrial heritage, and industrial art (Storm, 2014). Bogulim, Strohmeier and Lehner (2012) referred to the transformation of the region as an ascent of the "phoenix from the ashes". Hence, after a decade, the image changed, and the region became a custodian of cultural

Fig. 7: Route of industrial heritage (author of the photographs I. Tandzegolskienė)

and industrial heritage, which is something that the community members perceived as a positive transformation (Knoll, 2014). The route of industrial heritage in Ruhr now includes 10 cities with rebuilt authentic and historically important places and museums (see Fig. 7) that encourage exploration and experimentation. They include ***Bochum*** (Railway museum, Century Hall, German Mining Museum); ***Dortmund*** (Zollern colliery, Hansa Coking Plant, Westphalia Stadium); ***Duisburg*** (Inner Harbour, German Inland Waterways Museum, Landschaftspark DuisburgNord); ***Essen*** (World Heritage site Zollverein Coal Mine Industrial Complex, Villa Hügel mansion, Ruhr Museum; Gelsenkirchen (North Star Park (Nordsternpark); ***Veltins-Arena*** (Football stadium); ***Hagen*** (Hagen Open-air Museum); ***Hattingen*** (Henrichshütte Industrial Museum); ***Oberhausen*** (Gasometer exhibition centre, Rhineland Industrial Museum); ***Waltrop*** (Old ship lift, Henrichenburg boat lift); and ***Witten*** (Nachtigall Coal Mine, Muttental valley).

Authentic and unique locations showing the city's great changes and transformations of industrial places and landscapes have been selected for the case

study. They include Landschaftspark DuisburgNord in Duisburg, Zollern colliery in Dortmund; World Heritage site Zollverein Coal Mine Industrial Complex and Ruhr Museum in Essen; and German Mining Museum in Bochum (Internet resource: https://alchetron.com/Rhine-Ruhr).

Presentation of Landschaftspark DuisburgNord in Duisburg

Critical events and identification of the change: internationally, the city of Duisburg is associated with heavy industry and an inland port. Today, it is still a city strong in steel production with impressive logistics centres. In order to identify the change factors, it is important to note the recognised and popular project of the Landschaftspark DuisburgNord (see Fig. 8) in the Duisburg Ruhr region. The Duisburg Iron Plant was closed in 1985, yet it was one of the few cases where the closure was not related to the economic change and the crisis. This closure was not emotionally difficult as all the workers retained their jobs, and the entire production process "moved" into another modernised factory. The closed factory was likely to be demolished, but a local initiative group started a discussion about preserving the site and eventually a 230-hectare site was sold by the factory owner for a symbolic price to a public body acting on behalf of Duisburg. The former industrial space with abandoned blast-furnaces, moulding machines, railway lines, tall cranes, tanks, warehouses, and administrative buildings has become a part of a large-scale revitalisation and transformation. Today, it is a landscape park which amazes with its industrial history, the "domestication" of the conception of industrial nature, and the establishment of recreational areas.

The model of the city image and the value of the place/object/landscape: Duisburg City is famous for its Landschaftspark DuisburgNord, which is considered a cultural and leisure park with several museums, such as German Inland Waterways Museum, Inner Harbour, and Museum of Modern Art and cycling trails such as Tiger & Turtle Magic Mountain. Like all the cities in the Ruhr area, Duisburg understood that the change was imminent and thereby became famous for cherishing its culture. Nowadays, the city can surprise by the creative reconstruction of closed objects. Apart from the former metallurgy giant which hosts one of the most beautiful industrial parks offering free movement and cultural and historical experience, the Duisburg harbour and storage facilities should also be mentioned. They have been converted into pedestrian zones and an office area. This immense project is spread over 89 ha and has the main goal: work, life, and leisure by the water. The city is also known for its cultural events taking place at the Theatre Duisburg, the Deutsche Opera

Fig. 8: The closed Duisburg plant is dominated by the concept of industrial nature (author of the photograph I. Tandzegolskienė)

am Rhein, and the Duisburg Philharmonic. Moreover, the city is known for its festivals such as the Duisburg Akzente and the Traumzeitfestival. Another cultural focus of the city is the Duisburg Film Week, which features German documentaries.

Using the scar metaphor to describe heritage: The Landschaftspark DuisburgNord has been recognised as an "abandoned" and devastated industrial site and can be described as its scar. Large and immobile buildings and the destroyed landscape are revitalised through the artificial creation of an

eco-system. Travelling across the plant site or observing the landscape from the top of the observation platforms, we can see how the idea of turning gigantic installations and buildings into industrial sculptures was implemented by deliberate additional planting of vegetation around them. This is evidenced by clean water channels and agglomeration clusters, concrete partitions overgrown with green climbing plants, built-in recreation spaces, separate children's playgrounds and elements of an eco-garden.

Examples of educational tourism and experience: The newly revitalised Landschaftspark DuisburgNord is open to all visitors and invites them to explore, discover, experience, and capture it with their cameras. The park administration offers to visit observation platforms, walk along the park paths and capture stagnant moments in the old factory, climb the blast-furnace and observe installations from above. This conception is interesting because nothing has been changed or renovated since the factory closed. Such an idea encourages learning about the past, experience changes evoked by time and nature, and provides each visitor with an opportunity to create their own story and "gather a personal bouquet of emotions". Furthermore, this place is also known for sport and cultural events: a former gasometer has been turned into a diving facility which is open to the public and hosted by the Park Diving Club. Former ore bunkers provide walls for a number of climbing paths that are also open to the public and much used by the local division of the German Alpine Club. Visitors can participate in various educational activities: team building activities, canoeing and polo playing on an old gasometer, and activities in various workshops (blacksmithing, car making, woodworking, graffiti drawings, and photo workshops). Activities are offered to both adults and children. Cinema connoisseurs can visit the Stadtwerke-Sommerkino event, which annually attracts over 30,000 viewers of summer cinema novelties at Landschaftspark Nord, whereas the illuminations created by the world-famous lighting designer Jonathan Park immerse the night factory into an unusual sea of colours at the end of each show.

Presentation of Zollern Colliery in Dortmund

Critical events and identification of the change: The global crisis of the early 1960s and changes in the market economy affected both the region as a whole and the region of Dortmund. In 1987, the last coal mine in Dortmund was shut down, marking the end of centuries-old traditions. Another painful blow was the steel crisis due to the lowered demand for it. Despite various measures and efforts, such as structural reorganisation and merging of corporations,

unemployment increased, and the region faced economic and social challenges to a stable life. During this period, the focus was on the reconstruction of the city centre and the preservation of the former industrial prosperity age. The aim was to create a unique, exciting, and travel-worthy concept of Dortmund. An important object of interest in Dortmund from the aesthetic perspective is the Zollern Colliery, the region's model coal mine built in 1989–1904. Some buildings of the mine were interesting architectural monuments built in Art Nouveau style and designed by the renowned architect Paul Knobbe.

Following the collapse of the coal mining industry in 1960s, the Zollern Colliery was closed in 1966. The preservation of the area was influenced by the emerging new trend. Namely, the concern to preserve the memory of the working-class history and the emergence of a new type of museums: decentralised industrial museums with a social history agenda and monuments left in situ, in combination with museum exhibitions located in the former industrial buildings. The site, buildings, and equipment were preserved and included in the Westphalian Industrial Museum in 1981. The Westphalia Museum of Industry is the first and the largest industrial museum in Germany, founded in 1979. The museum includes eight industrial sites and locations in different cities in the Ruhr area: Zollern Coal Mine in Dortmund, Hannover Coal Mine in Bochum, Nightingale Mine in Witten, Henrichshutte Metallurgy in Hattingen, Henrichenburg Ship Elevator in Waltrope, the Bocholt Textile Factory, the Lage Brick Museum, and the Gernheim Glass Factory in Petershagen. The mission of the museum is to communicate, research, and preserve the culture of the industrial period. The most important exhibits in this museum are the industrial buildings turned into monuments, and the focus is on people whose lives and work have been associated with factories and mills.

The model of the city image and the value of the place/object/landscape: In the past, Dortmund was a famous city with its iron and steel plants, yet the last plant was closed in 2001. As a traditional site for mining and heavy industry in the Ruhr area, Dortmund is today a venue for culture, exhibitions, various events, and museum presentations. The industrial city became the "carrier" of history via its museums. Besides, the city is also seen as a venue for Ruhr area "domicile" jazz, world-style, and avant-garde music events. The city has also taken a turn towards cherishing culture, which is evidenced by the opera house, drama theatre, children's and youth theatre, the newly founded children's opera theatre, the Oswal and Adlertum museums, and the Dortmund Philharmonic. The area is also famous for other industrial heritage objects, such as the Kokerei Hansa, a museum for the presentation of the world of work. The entire history

Fig. 9: Aesthetic value of Zollern Colliery architectural monument (author of the photograph I. Tandzegolskienė)

of labour and labour protection in a chronological order is presented considering technological advances, the environment, and its protection.

Using the scar metaphor to describe heritage: The object under analysis, the Zollern Colliery in Dortmund, is presented as an architectural monument and as an aesthetic place where the history of daily work is displayed and showcased through beautiful and exhilarating memories of work. Although much attention is paid to the experience and history of labour and the people who worked there, the scar metaphor is hidden under the facades of gorgeous buildings. The exhausting human labour and hard daily life is retouched by the exaltation of architectural buildings (see Fig. 9).

Examples of educational tourism and experience gained: In 1999, the Zollern Colliery started functioning as a museum of the social and cultural history of coal mining in the Ruhr area. The museum presents itself as a living

industrial heritage site and a regional cultural forum. Although the branches of the museum are different, they are united by live presentation of the history of industry: history can be experienced there by weaving on the looms, laying bricks or blowing glass. The thematic division of the museum exposition is in line with its mission ("to communicate, explore and preserve the culture of the industrial era") and its title (Ruhr Museum of the Social and Cultural History). It emphasises not only the political-economic history of industrialisation, but also the daily life of miners and their families, their work, lifestyle, fashion, and leisure; as well as the political safety, hygiene, and other realities of miners. Alongside traditional museum exhibits (authentic objects, texts, photographs, videos, hands-on installations), there is a wealth of experiential activities: the visitors can go down into the cellars and experience the darkness of a coal mine, or they can climb onto the top of the production building and admire the greatness of the surroundings. They can also experience the scope and magnificence of production in the engine building because the original equipment was left in a giant empty space or can sit in a tiny coal-miners' wagon. The exhibition combines the presentation of the official historical information with a personalised narrative. An example is the "student Franz" who is a guide for children. The cardboard student Franz takes part in a special storytelling for children and appears in both production buildings and throughout exhibitions. Another example could be biographical objects and the life stories of concrete people. History is brought closer to visitors' lives through participation in shared human experiences that lead to involvement in learning.

Furthermore, science is represented in the Ruhr Museum of Social and Cultural History at the Zollern Colliery and reflects the features of a contemporary science museum. The narrative lines of the museum's exposition do not tell the immanent history of industrialisation (historical circumstances, economics, owners, development of the construction, coal mining industry). Rather, the exposition is clearly linked to the socio-cultural, economic, and historical context of the region. The museum raises questions about the dark sides of industrialisation (labour, exploitation, living and working conditions, disasters). The displays present industrialisation in an open, non-historical narrative, pointing to the different components of the phenomenon – work, everyday life, leisure, machinery, technical process, and architecture. Industrialisation is closely linked to the history of labour but avoids displaying "labour without workers" (where only the machinery and the production process are presented) and does vice versa – people are at the centre of the narrative.

Presentation of the World Heritage Site Zollverein Coal Mine Industrial Complex in Essen

Critical events and identification of the change: Essen has been known since the 19th century for its iron mines and industrial structures which occupied an area of 35 hectares. Although this period of industry and industrialisation is an issue of the past, industrial heritage still shapes the city. Closed mines and factories give the city its uniqueness and tell an enticing story. The Ruhr Museum in Essen was founded in 1904 as a museum of nature, history, and art. It was moved to a transformed coal mine building in 2010 (the authors of the transformation: Office for Metropolitan Architecture/Heinrich Boll and Hans Krabel). What makes this museum unique is that it presents not only the history of industrialisation, but also the natural and cultural history of the entire region from the geological period to the present day. Since 2001, World Heritage Site Zollverein Coal Mine Industrial Complex has been listed in the UNESCO World Heritage Sites. The mine is considered to be the centrepiece of the Route of Industrial Heritage and attracts more than 1.5 million visitors each year. The complex is unique as it dates back to the 19th century and reminds us of the building's magnificent existence (in 1970 it was the largest and the most modern industrial site in Europe). The year 1986 marked the end of this giant's life. The continuity of the complex was foreseen immediately after the closure, and the reconstruction work started in 1990. This is how the Ruhr Museum was opened in the coal-washing building, the Red Dot design centre was established in the boiler and a casino in the low-pressure compressor building. The World Heritage Site at the Zollverein Coal Mine Industrial Complex has spaces for artists, local salespersons, an ice arena, a swimming pool, a conference room, and a restaurant complex.

The model of the city image and the value of the place/object/landscape: Iron and steel used to be important in this city, but today it is admired for unconventional artistic solutions, museums, and art spaces. As an example, the Kulturpfad cultural trail is covered with blue stones. The trail stretches for 4 kilometres with 372 blue signs pointing to the 82 Stadtzeichen symbols of the city. They highlight the extraordinary architecture and public spaces that are adapted for arts and invite visitors to wonder, engage, and discuss. The city attracts by its cultural objects, such as the Poster Museum hosting a collection of more than 350,000 posters from the political, business, and cultural spheres, while largely focusing on documenting German poster design in the European context. Moreover, it attracts visitors by the Lichtburg Cinema, which is the largest cinema hall in Germany and also the oldest cinema still showing films.

Every year at the beginning of the summer, the Kulturpfad Fest is held in Essen with performances by music, theatre, and light professionals.

Using the scar metaphor to describe heritage: When reflecting on the Zollverein Coal Mine Industrial Complex, it is possible to talk about large structures, gigantic installations, and a fairly large area which was dedicated to industrial development. The size of the site itself and the visible devastation of nature can be described as a scar here. The inefficient buildings were "revived" and identified as necessary. They were resurrected as spaces that serve art, entertainment, and historical memory. The museum focuses on the activities which are very diverse and dedicated to exploring the region and preserving memory. The conception of the museum is focused on aesthetics and presentation of culture and education, based on various means (photography, short film screenings, artefacts, virtual maps, installations, visualisations).

Examples of educational tourism and experience: The Ruhr museum is founded in Zollvere in Coal Mine Industrial Complex. The main mission of the museum is to serve as a place of remembrance for the region. The Ruhr Museum is considered one of the first museums in Germany to combine the history of industrialisation with the theme of everyday life and social history. The museum's exposition is divided into three main themes: "the Present", "the Memory", and "the History." These themes, in turn, fall into subtler narratives. "The Present" introduces myths and stereotypes about the Ruhr region through such topics as work, solidarity, or homeland. In the section "Phenomena", the visitors can get acquainted with the ethnic and linguistic composition of the region's inhabitants, their hobbies, pets, small architecture (kiosks), leisure, culture, "industrial" nature, and the sounds and smells that are typical to the region. The narrative of the exhibition is complemented by a personalised way of presenting the story: talking to three "heroes" about what they value in the region. The second part of "the Present" is entitled "Time Stamps". In this section, natural objects (fossils, minerals) and "biographical objects" brought by people are displayed next to each other along special stories told about them. They present a map of modern collective memory.

"The Memory" exposition tells the geological, biological, archaeological, and cultural history of the region from ancient times to the present. It presents historical periods (Bronze Age, Stone Age, etc.); cultural movements (Reformation, Enlightenment, etc.); and various geological, archaeological, and cultural collections. "The History" exposition displays the history of industrialisation in the Ruhr region from the 19th century to the present day. This narrative is constructed on the basis of dramaturgical principles: prologue (history of the geological strata of the region), beginnings (1750–1830), fossils, technical

innovations (1830–1870), the rise (politics and business 1870–1914), urbanisation (1914–1957), and transformations (1957–2010).

In addition, temporary exhibitions are held alongside the permanent exposition of the museum. The museum also offers "Coal Road" tours, where visitors have an opportunity to visit a coal processing plant with a guide and walk the coal mining and processing path in an industrial building that has been preserved in the same condition as it was left by the last miners in 1986. The thematic division of the museum exposition is in line with the aim of the museum's mission – to become the site of regional memory as it encompasses the whole of the region's history.

The museum's exposition combines learning and entertainment. The exposition presents a variety of exhibits: authentic artefacts (old industrial installations, biological, geological, cultural objects), art works, photographs, stories, video material, explanatory texts, sound and scent installations, and information terminals. It is important that exhibits from the museum's collections are displayed alongside with "biographical objects" that tell the story of everyday life. This way they combine natural and cultural history as well as historical facts and personal narratives of people. Leisure learning is illustrated by experiential activities, such as the "coal path" excursion and the opportunity to climb to the 45-metre height to admire the surroundings. The representation of science at the Ruhr Museum reflects the features of a contemporary science museum. The narrative lines of the museum's exposition do not emphasise the history of the industrialisation development but relate it to the natural, economic, social, and cultural processes of the region. The exposition presents industrialisation through its impact on nature and human life. The exhibition links the processes of industrialisation to the experiences of visitors through biographical and everyday stories. The Ruhr Museum focuses on audiences of different ages. Experiential activities are more focused on older high school children and young adults.

The authentic environment and the preserved equipment may interest science and technology admirers. Additional activities offered by the museum include a café and restaurant, an entertainment complex, and a variety of cultural events aimed at families who come here for longer periods of time. The Ruhr Museum uses various models of active learning: from interactive facilities, authentic artefacts, atmosphere of authentic environment to experiential activities, a factory tour, and information terminals. Emphasis is placed on aesthetic experience: smells, sounds, and theatrical atmosphere that is designed with the help of installations, colours, lighting, etc.

Presentation of German Mining Museum in Bochum

Critical events and identification of the change: The "golden age" of Bochum refers to the 19th century, when the Association for Mining and Steel Casting was established. A hundred years later, unfortunately, the first mines and pits were closed. One of the vital decisions of the post-war period was the establishment of the Ruhr University, which is currently one of the largest universities in Germany. This decision allowed the region to acquire a new role of an innovator in economic services, logistics, and healthcare. The Eisenbahnmuseum Bochum Railway Museum and the Deutsche Bergbau Museum, the German Mining Museum, are the reminders of coal mining and production facilities today. The German Mining Museum is one of the eight museums in Germany associated with archiving coal mining documents and recording historical industrial developments. The museum was founded and opened in 1930 in a former meat processing plant. In 2009, new buildings were erected by the industrialist architect Fritz Schupp, who converted the Essen coal plant into a museum.

The model of the city image and the value of the place/object/landscape: Nowadays, no one denies Bochum's past – it is presented as part of heritage and an example of great strategic planning that shows how an industrial city can become a cultural centre. Over 400,000 visitors annually descend to the museum grounds first and then ascend to a 63-metre-high supply tower overlooking Bochum and providing magnificent views. The beginning of the change was difficult because coal mining became unpopular in the 1960s, and the entire region had to be reborn immediately, literally overnight. With the establishment of the Ruhr University, which was run by different leaders at different stages (Peter Zadek, Claus Peymann and Leander Haußmann), and which became one of the best higher education institutions in the region, the Bochumer Schauspielhaus (Bochum Academic Theatre), the most innovative and radical theatre in Germany emerged alongside. Major international events, such as the Ruhr Triennial, the Klavier-Festival Ruhr, and the Ruhr Festivals have made the region one of the most picturesque cultural landscapes in the whole continent. With Bochum becoming the European Capital of Culture (RUHR, 2010), this new identity has become the symbol of the city: change through culture and culture through change where industrial installations have become new scenes for interesting and exciting art. The idyll of the Ruhr Region includes Dahlhauser Settlement in Heid and Miners Settlement in Bochum. The Dahlhauser in Heid was founded in 1906–1915 as an exemplary colony of workers in the adjacent Hanover pit. Also known as the Kappeskolonie, the

settlement is among the most beautiful in the Ruhr region. It was designed and built as a green settlement by Robert Schmoll, the architect of the industrialist Krup family.

Using the scar metaphor to describe heritage: The analysis of this object reveals that the city itself can be distinguished as a large cultural centre which created its own traditions and new experiences. The history of industrial heritage and the changes that have taken place throughout this period are preserved and recorded in the city Museum. The suspension of the activities in the region, and the closure of mines and pits, can be considered as a scar of this region. The museum collects all the information about the period of stagnation in the region and depicts the nature of labour in the simulator, yet only the beautiful side of the story is visible. The other side of the story is presented with caution. This implies that the history of mining and coal mining is a thing of the past, and the focus is on the search for and creation of a new identity.

Examples of educational tourism and experience: The German Mining Museum invites the visitors to experience the subtleties of the mining world by visiting a 20-metre-deep demonstration mine with a guide underneath the museum. The route extends for about 2.5 km, where one can see the working routine of the miner as well as the tools and impressive machinery. The simulated experiential journey begins in the elevator descending at high speeds, thus allowing visitors to experience the vibrations and the noise. The narrator plays a very important role because the tour guide immerses visitors in the chronological events, which show the historical changes of tools and the work process, the use of tools and principles of machinery work, the everyday life and labour of workers, and the advantages of the latest industrial machinery. Thus, from the very beginning of the journey, the visitor is introduced to the first anchorage elements, the need for a horse as a vehicle, the train path, various drilling machines, and modern equipment. The route offers a powerful experience with the possibility of touching, testing, and discussing with the tour guide.

Since July 2019, the museum has been offering visitors a revitalised exposition that covers four themes: coal, mining, natural resources, and art. The first theme focuses on the history of the German coal industry. The second theme deals with the history of materials' science, mining, and industrialisation. The third theme presents natural resources, which are of immense benefit to humans today. The exhibits are presented using artefacts, laboratories, and installations. The exposition of the fourth theme presents mining peculiarities, where the scope of presentation ranges from artists' works to sculptures, paintings, and craft objects. The museum focuses on all age groups, creating

a variety of options for experiential and new knowledge construction. In addition, students are offered various workshops like Coal Mining, Stone – a Window into the Past, Mining Yesterday and Today, How to Get Coal, and others.

After analysing industrial heritage and post-industrial landscape preservation, urban transformation, and heritage/landscape adaptation opportunities for new functioning, it is important to discuss a complex transformation at the cultural, historical, social, aesthetic, and ecological level, where planning and publicising cultural events as well as raising awareness of educational tourism at the local, regional and international levels are considered the key elements for change.

The presented cities focus on the socio-cultural context: theatre and opera performances, music festivals, various concerts, and cinema events; the historical context covers the use of museums and heritage spaces for meetings, concerts, and creative artistic solutions; whereas the ecological context embraces revitalisation of the landscape through creation of leisure areas, experiential paths, elements of eco-gardening, the use of water bodies and reservoirs for walking and recreation areas, and education. The city government, business, various public organisations, and community members could be involved in the project developing a new concept and restoring industrial heritage and the post-industrial landscape, thus ensuring creative and innovative ideas and public dialogue. According to Strom (2014) both Swedish and German strategies are similar in that the transformation process focuses on cultural and economic development. It is important that industrial heritage sites in this region are often associated with the preservation of heritage, values, and remembrance.

The Industrial Heritage in the Ignalina Nuclear Power Plant Region and Visaginas City

The case of the transformation of Ruhr area in Germany discussed above helps to acquire ideas and experience for the principles of possible identification of the value of industrial heritage in Lithuania. It would also be possible to use the metaphor of scarring to identify, discuss, and describe the visible, felt, or forgotten scars. The presented stages of industrial heritage construction development could also be used to transform and give meaning to objects, sites, or the landscape.

The city of Visaginas and the INPP, which is currently closed, are a distinctive example of industrialisation and "lost utopia" (Storm, 2014). Atomic

Visaginas city is a relatively young urban settlement founded in 1975 as a satellite to the INPP. Visaginas is an example of a city, the dominant sections of which were constructed to form habitats under the Soviet social paradigm. Most of the inhabitants were Russian speakers from other Soviet Socialist Republics. During the construction of the INPP, non-Lithuanian speaking highly educated persons moved to the area for work reasons, and the town of Visaginas was built to accommodate them. INPP is a closed nuclear plant consisting of two modules RBMK-1500 built close to the Visaginas City (Lithuania). Ignalina NPP decommissioning project includes decommissioning of Unit 1 and 2 and auxiliary facilities. The process is divided into two phases. The first phase started in 2004 and continued until 2013. The second phase was scheduled for 2014–2029. By 2030, the site of the two reactors should have been ready for re-use. All the decommissioning activities are planned to be finished by 2038.

The city of Visaginas, which is referred to as "the city of Lithuania, the avant-garde of high technologies" (Šliavaitė, 2010:99) in the Visaginas City Development Programme for 2001–2030, evolved from scratch: people, construction, and building materials for the city and the INPP. The older population of Visaginas remembers the construction period as very socially and economically beneficial to the country (the Soviet Union is meant), and even to a certain extent as a heroic period of their life (Šliavaitė, 2010). The future residents of the Visaginas City came from various parts of the large country and were promised an urban lifestyle – new dwellings in blocks of flats, cinemas, schools, a medical centre, and stable jobs at the INPP. The artificially formed sense of identity in this type of a city is difficult to replicate in other cities as it evolved and changed. People there had to learn to live together and to adapt to one another. The mother tongue of many Visaginas residents is Russian. The population consists of builders, engineers and physicists, and high-quality specialists who came to work at the nuclear power plant and who stayed in Lithuania after 1991. This again demonstrates the authenticity of the city because its people developed a collective attitude where the material reality is less important than the pursuit and promotion of the common goal. Unlike in the West, however, the vision of the collective spirit of a Soviet industrial city was carefully designed and controlled by the state and responsible institutions and in many cases was dependent on the state's political and economic strategy (Pusca, 2010). The collapse of this system, and the change in the economic situation led to a change in attitudes towards collective identity largely attributable to the exaltation of the work process, heroism, and five-year plans. Thus, political and economic changes can be described as a scar in the sense of energy security and in relation to the INPP, which are closely related to the city of Visaginas. The German

scholar Ackermann (2017:280) aptly describes cardinal changes and context changes: "The most important decisions regarding the nuclear power plant were made in Moscow up to 1990. Since 2004, the bureaucrats in Brussels have been answering the most important questions about the power plant, as the closure of both reactors costing billions of Euros is only possible with EU support."

The critical discourse analysis performed by the authors Mažeikienė, Kasperiūnienė and Tandzegolskienė (2018) highlights the main themes discussed in the media describing the work of INPP decommissioning and dismantling. Namely, the most frequently discussed issues are decommissioning management problems, terms of waste repository installation, decommissioning complex and complicated processes such as the provision of a funding mechanism, cases of the lack of transparency at the INPP, and the persistent lack of information on the ongoing work and its safety. Meanwhile, Visaginas, which was built for the continuous and stable operation of the INPP, is mentioned much less in the media and is not associated with the INPP as an object adjacent to the city. The main themes of media coverage on Visaginas include the search for the urban identity and various cultural events, new professional discoveries of the city residents, and strategic considerations of attracting external investors. The city is often referred to as a dead city that is always seeking for its own identity and a new face.

The suspension of the reactors marked the decline of this industrial city and prompted the search for a new identity. Now it is important for this city to develop a strategy for some space and something new that can attract tourists/visitors while preserving actual formal spaces, restoring new similar spaces, and creating a lasting memory of the city and its industrial heritage and landscape. Meanwhile, the closure of the INPP creates a new narrative that is associated to "gate closure", job losses, destruction of the structures, destruction of the inventory, "scattering" of the local community identity, and more dramatically, INPP is not currently engaged in a mutual dialogue on a coherent and sustainable search for and creation of a common conception of the city and the region. Considering the changes in the city, it is possible to maintain that the history of the city attracts artists and scholars. Annual events are currently organised in the city: Visaginas city festival "Celebrate Visaginas", Country Music Festival, International Festival of National Cultures "Rudeninė". Scientists work on various projects in Visaginas and search for answers and changes in the identity of the industrial city. One of the most famous is the Laboratory of Critical Urbanism by Ackerman, Cope and Liubimau (2016) that receives support from the German Embassy. Researchers of Vytautas Magnus University also carry

out a project in this region; its title is linked with the search for the opportunities to develop nuclear educational tourism in the region (EDUTOM project).

An interesting photographic project "Babochka" (Photographer Jonty Tacon) aims to present the idea of a Soviet nuclear power plant by capturing the exotics of the past idea, the realities of the present moments during the closure of the plant, the need to separate the city from the "atomgrad" conception, and the disintegration of the community identity. The mood of the city and the community during the closure of the INPP are reflected in the documentary "Butterfly City" (Olga Černovaitė). It raises discussion on the problems, changes, and visions of the Visaginas residents in the context of the INPP closure. Additionally, the play "Green Grass" was created based on the stories of the INPP and Visaginas and told by the residents and INPP workers. It was successfully shown in Visaginas and other cities. The directors Jon Tertel and Kristina Werner represent the idea of INPP workers and residents of Visaginas who ultimately dream about dismantling of the power plant until all the turbines are cut, the reactors dismantled and the radioactive fuel buried, and nothing is left in the place of the plant except a green lawn.

The INPP dismantling can be observed on the monitor in the information centre of the Power Plant. It is also possible to see the dismantling project and obtain information on the work progress from the professional staff of the communications department. Interestingly, after the release of the film about Chernobyl, the flow of tourists to the power plant increased as the previous model of the Reaktor bolshoy moshchnosty kanalny (RBMK) reactor was assembled in Chernobyl, and some scenes of the film were filmed on the premises of that power plant.

During the presentation, one can discover that the city is looking for a new face and is on the right path in doing so in the cultural context as illustrated by the examples described. Besides, it is possible to distinguish the authenticity of the city in that it is multicultural and because it is located on the shore of the lake. Although this is typical of industrial structures, the pine forest gives the city a green face. Hence, another potential element of the transformation is the ecological context which is highly welcomed at the political and community level in the city. However, the historical context as an integral part of the transformation plays an important role in constructing the new identity of the industrial city and the post-industrial landscape. The exhibits or heritage objects of the city and the INPP should have common spaces and a clear narrative line. Moreover, it is advisable to plan educational tourism programmes at both formal and non-formal education levels. The main themes that can be introduced in educational tourism could include:

- Interesting and inspiring stories from the early days of industry to the present day;
- The emergence and development of creative and attractive places;
- History of local identity formation;
- Themes on the authenticity of the area developed on the basis of cultural events;
- Educational lectures, field workshops, laboratory work, and simulations as an opportunity for different age groups to know the history of the atom;
- The city in the form of a butterfly, distinguishing authenticity;
- Tourism development based on the film industry;
- Gastronomy and heritage.

The provided example of the Ruhr area in Germany demonstrates that critical moments of change encourage the search for new strategies through collaboration between different organisations and stakeholders, bringing together certain elements of the transformation with clear objects and processes. An example is the "Kulturpfad" blue stones of the Essen City Cultural Trail, which loudly announces that the city focuses on cultural symbols and the opportunity to explore the city through culture. The INPP secrets and the past history if rebuilt and revived could be associated with the goals of educational tourism. Furthermore, in collaboration with urban activists, politicians, and the community, a common and uniform conception of urban and regional industrial heritage and post-industrial landscape could be formed. Murphy and Boyle (2005) emphasise community engagement. In the case of the city of Visaginas, this initiative is gaining strength and is a significant condition for the city to change its identity. It would be desirable to look for the uniqueness of the city and the area linking it to specific places, projects, and people's experiences.

Generalisation

The industrial changes have led to radical processes of the revitalisation of industrial objects, as well as urban and post-industrial landscapes that are associated with identity rethinking, transformation, denial, forgetfulness, or decline. This is not an easy process because on one hand, it involves searching for a new narrative seeking to preserve the past experiences and scars and on the other demonstrating that forgetting or reviving are not easy processes. In the analysed regions and areas, the transformations have been largely affected by the social identity formation. This revival is observed through nostalgia, retreat and default, which inspire new value and refocus. Therefore, Lithuania

does not intend to attach itself to industrial heritage objects as they are associated with negative and painful experiences that serve as reminiscences of utopian goals and large constructions, hard and pointless work, and typical and unified architecture. Industrial heritage objects and distorted landscapes also presuppose discussion on the scars of industrial revolution that exist and manifest themselves through landscape devastation, urbanisation, and the gigantic nature and inefficiency of factories and plants. Such scars are most acceptable because they identify the cause and aim of revitalising the landscape, the city, and the objects themselves. Regarding these scars, the revitalisation of the landscape or object is attempted to be embedded in buildings, stories, or interesting structures by slightly covering or retouching the pain. It is a bit harder for objects to be labelled as industrial heritage scars that resemble a certain historical period, when a place, a particular object, or landscape is romanticised, yet at the same time frighten us with the remaining heavy ruins. The third form of the scar includes objects, locations, or landscapes that are not perceived and identified as part of a cultural object. Consequently, there is a danger of collapse, forgetfulness, and difficult search for own identity. By reconstructing the identity of a place, city, or object and creating the memory of a place of industrial heritage, industrial culture telling about community traditions, values, and customs is also created; it is associated with an epoch of industrial prosperity created by regional identities and symbols; give local residents and newcomers an opportunity to participate in the region's memory preservation and in the process of search for identity.

Industrial heritage objects are part of the cultural heritage, which implies that it is important to preserve industrial heritage to society. The constructivist philosophical approach encourages discussion on the construction of a relationship through the narratives of history and everyday life, the demonstration of objects through archival data, and authentic stories and installations that link the experience of the past to the present. During an experiential trip to these objects, tourists/visitors can learn from the scar metaphor either consciously or subconsciously and seek an emotional connection to the location or object. Industrial heritage objects or post-industrial landscapes attract tourists/visitors as they symbolise the recent past. They bring them back to remembrance and allow them to gain experience using the available tools of experiential learning. These places and objects offer experiential learning opportunities and experiences that help analyse unconventional solutions by viewing artefacts, listening to stories, or studying constructions of the atypical architectural decisions through innovative educational, leisure, and experiential programmes.

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