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Stakeholder Engagement During Development of Theistareykir Geothermal Power Plant

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ABSTRACT

Landsvirkjun´s corporate strategy is to utilize renewable power resources in harmony with the environment and society. Large part of Iceland is uninhabited and the location of most large power plants are in rural areas and natural landscape of wilderness. There is an ongoing discussion in the society regarding the need for more power plants to meet increasing energy demand and the focus is on the site locations in the natural environment and its impacts. Thus, stakeholder engagement is an important part during design and construction of new power plants. Various stakeholder groups have different objectives and opinion. Those that expect to gain economic or social benefits are usually more positive while others are concerned regarding negative impact on the natural environment and how they perceive being in the area in question before and after. It is thus important to identify major stakeholders early in the project´s process and develop an open and honest dialogue. We will describe how Landsvirkjun collaborated with stakeholders in the local community when developing the new power plant at Theistareykir. The project´s objective was to harness the geothermal area and use it to improve the local economy and livelihood in the surrounding area. At the same time there were concerns regarding the unique nature at site. Thus, environmental performance was of a great concern in this project and special emphasis on harmonizing utilization and protection. In our experience an active stakeholder engagement was an important factor for the success of the project and the positive local support during the construction phase.

1. INTRODUCTION

Iceland is an island of 103.000 km^2 with about 330.000 residents. Large part of the country is uninhabited and the location of most of the large power plants are in rural areas and natural landscape of wilderness. Almost 100% of Iceland´s electricity is from renewable energy resources and Landsvirkjun generates 75% of this electricity. In 2018 the company fed 14,195 GWh of electrical energy into the transmission grid in Iceland, 92% using hydropower and 8% using geothermal energy (Landsvirkjun, 2019).

There is an ongoing discussion in the society regarding the need for more power plants to meet increasing energy demand and the focus is on the site locations in the natural environment and its impacts. Thus, stakeholder engagement is an important part during design and construction of new power plant. Landsvirkjun, The National Power Company of Iceland, is a state-owned company and its role is to maximize the potential yield and value of the natural resources it has been entrusted with in a sustainable, responsible and efficient manner, encouraging unity and support from stakeholders via open and honest communication. The company's strategy is to contribute to the sustainable development of society. It is a leader in the handling of environmental issues and is committed to its social responsibility.

In 2015-2018 Landsvirkjun built a geothermal power plant in the greenfield area at Theistareykir, NE-Iceland, now with installed power of 90 MW. The key project objectives were to maximize the yield and value of the available geothermal energy at the Theistareykir geothermal area in North-East Iceland in a sustainable, responsible and efficient manner. The project benefit for the local communities was a 90 MW geothermal power plant capable for long term production of electricity generated from geothermal steam originated from the volcanic activities of the area, serving localized industry and hence the local communities for the long future to come. As the area is partly included in the Icelandic Nature Conservation Register, the project objectives were to minimize the project footprint and carefully control environmental aspects. This paper will describe how the project team organized the stakeholder engagement and how Landsvirkjun collaborated with stakeholders in the local community when developing the new power plant at Theistareykir.

Figure 1: Theistareykir Geothermal Power Plant, 90 MW.

2. A NEW POWER PLANT IN A UNIQUE NATURE TO BENEFIT THE LOCAL COMMUNITY

Theistareykir is located in the north-east part of Iceland, about 26 km from the town Húsavík. The population in the municipalities closest to the project is around 4.200 persons. Akureyri, the largest town in the north Iceland with a little over 18.000 people is a 90 min drive from the site.

Theistareykir is approximately 330 meters above sea level north of the Bæjarfjall Mountain. Theistareykjahraun Lava Field is the most recent lava field in the area, estimated to be 2.400 years old and is approx. 525 km^2. The lava field is mainly characterized by a long, curved chain of lava formations stretching northward from the crater Stórihver. The geothermal area at Theistareykir is registered in the Icelandic Nature Conservation Register because of its miscellaneous geothermal structures, fumarols and sulfataras, deposits in the northern slopes of Bæjarfjall and at Bóndhóll, as well as habitat for geothermal plants.

The area was previously relatively untouched, except for archaeological remains from farming and traces of Sulphur mining from previous centuries, therefore visitors experienced the area as wilderness. Nowadays, it is uninhabited, but there is a ramblers' hut in the area which is used as a grazing common for 5000 sheep.

Figure 2: Geological formations in the Theistareykir area.

Preparation work and research on the sustainable utilization of geothermal energy at Theistareykir began in 1999 by an association founded by local municipalities and regional utility companies. The association later merged into Landsvirkjun. The objective was to harness the geothermal resource in a sustainable way for the benefit of the municipalities. The project benefit for the local communities was a 90 MW geothermal power plant capable for long term production of electricity generated from geothermal steam originated from the volcanic activities of the area, serving localized industry and hence the local communities for the long future to come. The unique nature of the area was given special consideration during the execution of all preparation and construction work and an emphasis was placed on environmental and social aspects.

The key project objectives were to maximize the yield and value of the available geothermal energy at Theistareykir in a sustainable, responsible and efficient manner. One of the risks that needed to be controlled in the project was the environmental impact of constructing the plant at the greenfield area of Theistareykir, area utilized by farmers as sheep grazing and by the local tourist operators for bike and horse riding tours. The area is partly included in the Icelandic Nature Conservation Register and there are both geological formations and cultural remains that are protected, the project objectives were also to minimize the project footprint and carefully control environmental aspects in good harmony with the local community and other stakeholders.

Early in the preparation phase, via Strategic Environmental Assessments of land use plans and the Environmental Impact Assessment for the project, the significant environmental aspects were identified, and monitoring plan of possible impacts launched. Ambitious mitigation opportunities were identified and implemented. High importance was placed on close cooperation with stakeholders in the local community, expert agencies and licensors.

3. STAKEHOLDER ENGAGEMENT

3.1 Strong focus on well-organized stakeholder management and engagement from project management

Landvirkjun´s strategy of sustainable harnessing of the geothermal reservoir with a minimum impact on the unique natural environment at Theistareykir for the benefits of the local community demanded a well-organized stakeholder management. Various stakeholder groups have different objectives and opinion. Those that expect to gain economic or social benefits are usually more positive while others are concerned regarding negative impact on the natural environment and how they perceive being in the area in question before and after. It is thus important to identify major stakeholders early in the project´s process and develop an open and honest dialogue. Thus, a comprehensive stakeholder management plan and communication process were developed to ensure that the project team was serving the stakeholders based on the different needs of various stakeholder groups.

Introduction of the planned project early in at the preparation stage and continuously during the project lifetime was of high importance. The main objective was to be in continuous consultation with stakeholders to improve the project´s execution, hear new ideas and angles to align the project results to the parties. An important part of the stakeholder engagement strategy was to clearly define the roles and responsibilities of project team members whilst facilitating active communication between parties across the project and within the company. With a clearly defined organization chart and a responsibility assignment matrix (RACI matrix) describing all major functions, roles and responsibility for each of the project team members a clear and open channels between all the key positions, corporate management and support functions were established ensuring that the company´s requirements and objectives are well known by all key individuals and followed at every stage, see Knútsson et al (2020).

To identify stakeholders and evaluate the need for contact and consultation an extensive stakeholder mapping was conducted for the project in its preparation phase and a communication plan was developed prior to the start-up of the execution phase. The stakeholder

mapping included both external and internal stakeholders, divided into four categories depending on the stakeholder's influence, authority and importance according to the project success as seen in Figure 3. The defined categories were: key-stakeholders, stakeholders to keep informed, stakeholders to keep satisfied and stakeholders that would follow-up on the project.

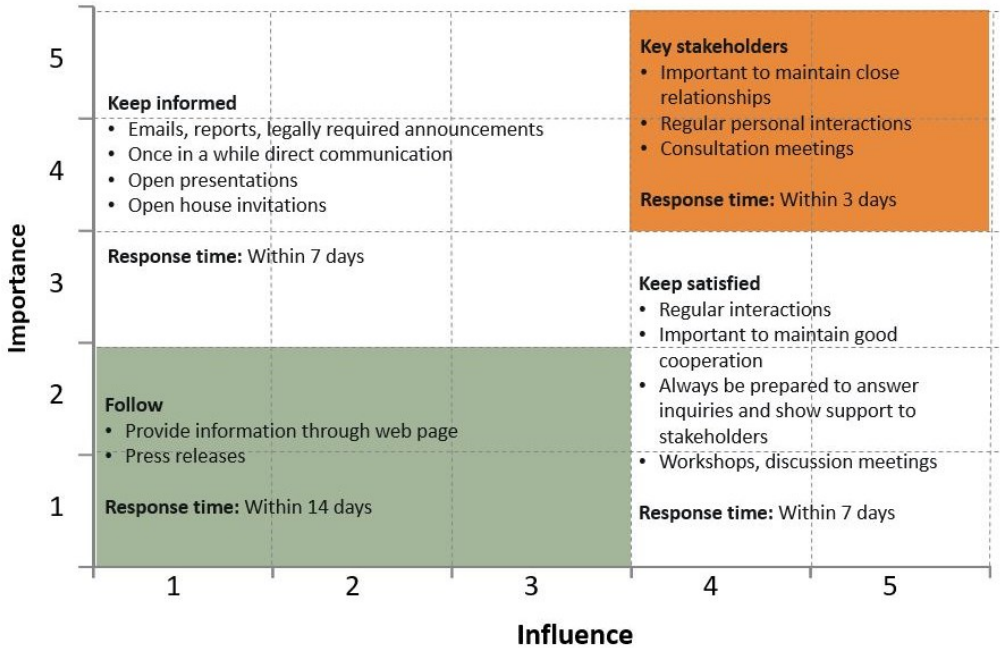

Figure 3: The categorization of stakeholder groups used in the Theistareykir project.

The project´s stakeholder engagement lifecycle represented in Figure 4 outlines the principles of Plan-Do-Check-Act continuous improvements process that was used as a guideline for the stakeholder management in the project. The four stages are: preparation, annual scheduling of communication, communication and consultation with stakeholders and follow-up. The frequency of contact and communication methods differed based on the categorization. The communication plan was updated at least annually.

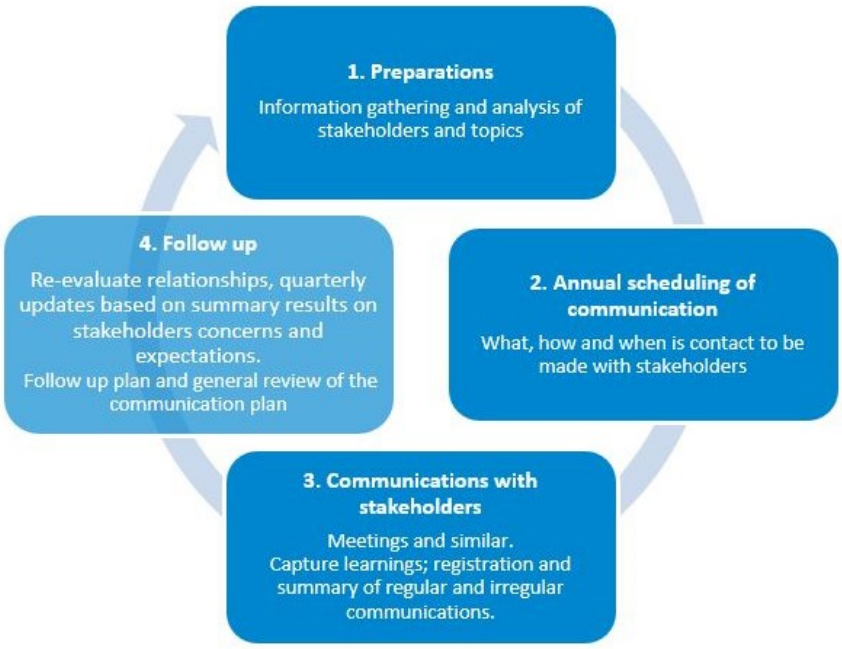

Figure 4: The lifecycle of stakeholder engagement in the Theistareykir project.

The communication plan for each calendar year was developed and the time, frequency and method of communication with each defined stakeholder was decided at the end of the previous year. A part of the stakeholder management was to register all stakeholder communication and plan for further communications with each stakeholder. A contingency plan was in place if needed, as seen in Figure 5.

Figure 5: The process for the contingency plan for stakeholder engagement in the Theistareykir project.

3.2 Open and transparent communication to all stakeholders

One of the main objectives of the project was to promote open and transparent access to information and to make the data easily accessible to all stakeholders. Several platforms were established to make this possible such as; open meetings, newsletters, news and general information on the project website brochures and on-site open houses, (Landsvirkjun, 2018). Emphasis was placed on creating accessible videos about the project, its process, and to explain specific matters of interest. Special arrangements were made with a local production company to regularly visit the construction site and collect data and videos that were made accessible on the project website. Stakeholders were able to monitor the progress of the project and got access to all relevant information. The visibility and accessibility of the project also caught the attention of several TV-stations, newsletters etc. Coverage of the project was always very positive which helped to maintain a positive project image.

Figure 6: Open houses were organized during construction to allow interested stakeholders to see for themselves the progress and talk first hand to the project team and contractors.

3.3 Special emphasis on consultation and collaboration with local stakeholders

As a result of an early consultation with the local community the project team was aware of the expectations regarding economic benefits with the power plant but also the concerns regarding the extent of impact on the natural environment. To be able to address that allocated members of the project team did plan to spend a great amount of time and effort visiting local stakeholders on their home ground during the preparation stage of the project and continued this work throughout the project's duration with meetings, newspaper interviews, public receptions etc. to reflect the importance of stakeholder engagement in the project, and the fact that the first preparation work for harnessing the geothermal energy of the Theistareykir area was initiated by the local municipalities in the area with the aim to result in positive socio-economic effects/benefits to the local community.

Regular meetings were held with stakeholders; both individually and in larger groups, to manage official and legal requirements, technical needs of the project output, municipality needs and expectations, safety and environmental requirements and expectations, labor conditions by contractors and sub-contractors as well as the needs and expectations of the public. Cooperation with the Occupational Safety and Public Health authorities, local fire brigades and labor unions on a special project advisory safety committee is an example of stakeholder incorporation beyond official and legal requirements. The main objective towards other stakeholders, i.e. among others the public, municipalities, land owners and contractors, was to communicate in an effective way the planned activities, the project progress and plan and execute countermeasures as part of mitigation of the projects impact.

As stated, stakeholder engagement and consultations were an important issue from the beginning and a series of meetings were scheduled with landowners and other key- stakeholders in the local community. The project director and the project´s environmental manager, organized one-on-one meetings with stakeholders throughout the project to inform local stakeholders about planned construction activities and to hear their expectations, concerns and suggestions on how the impact on the natural environment could be minimized. Mitigation measures were discussed and incorporated into the project plans and implemented alongside construction work. Following are three examples of collaboration projects that were initiated as a result of communication and consultation with the local community.

3.3.1 Land reclamation with landowners

Prior to the construction activities the project area was used for sheep grazing and large areas surrounding the project area had suffered soil erosion for a long time. As a result of consultation during design and preparation stage the project team and landowners did decide to work on a joint reclamation projects during construction. The aim was to decrease soil erosion with land reclamation in the vicinity of the construction area and by doing that compensating for the grazing land taken under construction.

A joint committee of landowners, members of project team and a representative from the local soil conservation service met regularly to plan actions and monitor the progress. This venue turned out to be an excellent forum to exchange views and building trust between parties, as well as improving the land with revegetation. The progress of the land reclamation projects was made publicly accessible via annual reports that were made available via the project website.

Figure 7: Land reclamation projects were initiated with landowners.

3.3.2 Workshop with local tourism associations

The project included a construction of a 30 km road to the power plant site which opened access to an area that had previously been out of reach for the general public. The area was used for recreation on horses, altered vehicles and snowmobiles. The active tourism in the area had been few guided horse-riding tours and mountain bike tours during the summer time. The road opened for new opportunities for tourism that at the same time raised concerns regarding possible effect on current recreation in the area and impact on the natural environment. There were also concerns regarding the safety of those travelling through the area during construction time.

To meet those concerns the project team got in touch with the local tourism associations and in collaboration hosted a consultation meeting open to all in January 2015. The objective of the meeting was to start a conversation between different stakeholders regarding how cooperation between tourism and Landsvirkjun would be best suited during construction and later operation of the power plant. The municipality, which is also the landowner, participated actively in the meeting. The main results of the meeting, published in an open report available at the project website, were: (1) to form a consultation forum during construction, (2) consider the reception of tourists in the summer of 2015; it was proposed to provide information signs, toilet facilities and consider protection of nature and safety of travelers during construction, (3) launch a work on site-planning for recreation and tourism at Theistareykir with broad perspective of what kind of tourism would be preferred to take place in the area (Landsvirkjun, 2015). Following up on the meeting Landsvirkjun did take actions regarding issues that were directed to the company specifically. The summer of 2015 information and traffic signs were in place and a follow up meeting held with tourist operators and municipality where communication paths and other issues were discussed further.

The participants did express gratitude towards Landsvirkjun´s to initiate communication between parties and the project team did experience good relationship throughout the construction phase founded on this successful start. The construction area was kept in good condition and kept open for public visitors throughout the construction period.

Figure 8: Consultation meetings were held with tourist operators and municipality regarding tourism and recreation in Theistareykir area during construction.

3.3.3 The North East Sustainability Project

A voluntary initiative by Landsvirkjun was taken to launch a regional sustainability project for North East Iceland, in cooperation with local municipalities and the University of Akureyri Research Center. The Húsavík Academic Centre was hired to manage the project. In addition, key stakeholders to the Theistareykir project; Landsnet, PCC Bakki Silicon and local tourism associations were also participating. The objective of the project was to develop key performance indicators with the local community to monitor the impact of the construction, and later operation of the Theistareykir Power Plant to society, the economy and the environment within the region affected.

The leadership of the regional North East Sustainability Project gave valuable input into the stakeholder mapping and communication plan as well as into interactions with the local community during the preparation and construction of the Theistareykir project. The fact that the North East Sustainability Project was ongoing through the construction of the power plant, and that it will continue in the coming years of the operation of the power plant, ensures a continuing focus on stakeholder interaction and consultation through the duration of the power plant's existence. The results are made available to the public via the program website www.gaumur.is (Þekkingarnet Þingeyinga, 2019).

It is Landsvirkjun's hope that the knowledge from the North East Sustainability Project will proof, through the years to come, that the company has reach its objectives which are to prepare and construct a 90 MW Geothermal Power Plant utilizing natural resources

in a sustainable way and the outcome, the Theistareykir Geothermal Power Plant will be a testament to the positive impact of Landsvirkjun in Iceland.

4. CONCLUSIONS

The construction of the 90 MW geothermal power plant proceeded according to schedule and power was supplied into the power grid as planned in good collaboration with the local community and other stakeholders. The plant´s geographical location and its connection to the weak power grid in the North East Iceland has created new alternatives for industrial opportunities in the area because of both increased power availability and electrical stability (Hardarson et al. 2018; Knútsson et al. 2018; Heimisson et al. 2020).

Continuous and honest collaboration with key stakeholders as well as communication with all other interested parties from the early preparation stage throughout the construction phase resulted in good result for both Landsvirkjun and the local community. We believe that well organized stakeholder engagement, executed whole heartedly by project team members, created respect and trust between the parties that contributed to open communication and shared understanding of the project. This was a key element of good consensus of the project.

The strong emphasis and dedications of the project team in stakeholder engagement with the local community was recognized when the project was audited according to the Geothermal Sustainability Assessment Protocol (GSAP) and received the highest rating for communication and stakeholder consultation (Hartman, 2017).

It was important throughout the project to feel the support of the locals and the willingness to be in good collaborations with the project team. Of course, there was not a full consensus on building a power plant in a greenfield area with sensitive nature. People were willing to be in contact with us regardless of their stand and share their opinions and concerns and we did our best to minimize the impact and communicate what we planned to do and how. In one of the open houses it was very valuable to hear from a visitor that despite the fact that he was not in favor of the project he was satisfied with how we had managed the project and showed the area the respect it deserved being a wilderness with sensitive geological formations.

In our experience an active stakeholder engagement was an important factor for the success of the project and the positive local support during the construction phase. References from key stakeholders during project closing phase, such as Municipalities, the Soil Conservation Service of Iceland and contractors participating in the project witness the positive communication and collaboration that took place during the project. This has also created a foundation for further collaboration between parties for upcoming projects.

The Theistareykir Geothermal Power Project participated in the 2019 IPMA Global Project Excellence Award for large and mega sized projects worldwide, where the project is evaluated and compared to a number of other projects. The IPMA PE – award committee has now announced the Theistareykir Geothermal Power Plant Project as one of the two finalists for the award in the large size group and the results will be made public at the 31st. IPMA World Congress in Merida, Mexico, in October 2019. This award appointment will without a doubt show that harnessing of geothermal power can be executed according to best practice of project management, which includes strong emphasis on stakeholder engagement and consensus with local community, with result that are benchmarking for the geothermal power industry.

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