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Lithuania: Baltic Solar Energy

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About

Case study name:
The greening of industries in the EU

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This study investigates green change in the Lithuanian company Baltic Solar Energy (BSE), specialising in photovoltaic energy and the manufacture of solar cells. The study demonstrates that the company's shift to the production of solar cells will most likely result in the significant expansion of green jobs; after restructuring, approximately 80% of the company's jobs will be newly created roles. It will also lead to the development of green skills, technical and engineering skills in particular. It is also anticipated that future green jobs will be better paid than the company's traditional jobs.

Introduction

Photovoltaic (PV) technology in Lithuania has had a long tradition of basic and applied research since the Soviet period. The accession of Lithuania to the EU, which opened up new possibilities to use European Structural Funds for the development of new prospective technologies, along with the global trend of accelerating the development of solar energy technologies, gave additional impetus to the growing interest of Lithuanian business in the area of photovoltaic/solar technologies. A number of Lithuanian companies, including Baltic Solar Energy (BSE), are in the process of developing a new solar energy sub-industry in the Baltic States.

BSE, based in Vilnius, Lithuania, started its activities in 2009 and specialises in experimental production of PV solar cells. BSE is a spin-off from the BOD Group, which was established in 1998. The company is an active member of the PV Technologies and Business Association and the PV Technology Cluster. Currently it has 14 employees.

There were two principal reasons for selecting this company for the case study. Firstly, BSE is engaged in an active collaboration process locally and internationally when anticipating, initiating, implementing and managing their green business practice as well as managing green skills needs. Secondly, the green change in BSE is predicted to contribute significantly to the development of green jobs and skills in Lithuania. The company is building the first research and experimental production centre for solar PV energy technologies in Lithuania.

Drivers and motivations

The main motivation for the green transition within the BOD Group and for the establishment of BSE came from the need to explore other business opportunities. JSC BOD Group was looking for a new business practice, where it could use and expand its industrial, commercial and marketing skills. The sector of solar (PV) energy was chosen because of its technological proximity to the sector of optical equipment, the company's original sector of specialisation. This motivation was strengthened by few additional drivers.

- **Support from foreign partners.** The company's long-term partner in Germany, Singulus Technologies AG, partly shifted its business activities to the solar technologies sector in 2007, and subsequently invited BSE to join this growing new sector, as well as explaining the future business prospects of the sector.
- **Public funding opportunities.** The decommissioning of the Ignalina Nuclear Power Plant made the issues related to the development of alternative energy sources highly relevant. Alternative energy was selected as a priority sector in the Lithuanian Innovation Strategy for 2010–2020; various types of support for developing research, collaboration and technology development activities are available for the period between 2007 and 2013.

- **Collaboration and support from local partners**. Based on the previously existing national PV technology platform, a group of companies joined forces in order to create a solar energy manufacturing sub-sector in Lithuania. Therefore, by establishing BSE and restructuring its business practices towards experimental production of PV solar cells, the company could take a leading role in the emerging value chain.

Green business practice

BSE focuses on both experimental research and manufacturing activities of PV solar cells. In a five-year period, BSE plans to gradually construct three production lines. The development of key technologies and manufacturing activities will be launched as soon as the research and experimental production centre for solar PV energy technologies is constructed (due to be completed in 2012). This new facility for experimental solar cell and module manufacturing, situated in the Visoriai Information Technologies Park, Vilnius, Lithuania, will encompass the BOD Group's BRD arm (optical media manufacturing), which will function as the main operator of the whole factory, the BSE section of the group (solar cells manufacturing, R&D), and Via Solis (PV module manufacturing, R&D). BSE, therefore, will function as one of the links in the value chain for PV systems. The value chain itself ranges from the processing of Silicon Basic Material to the installation of modules for its users.

The PV solar cell is a key technology in the value chain for PV systems. Hence, the company will take a central part in the emerging solar energy sub-sector in Lithuania. In a five-year period, BSE plans to gradually construct three production lines. According to the BSE's long-term business plans, in the medium term the company will expand its business activities to other links in the value chain and will encompass installation of final products for users.

Construction of the experimental solar cell and module manufacturing facility, which will cover 27,000 m^2, is funded mainly through the bank loans granted to the company, while the EU Structural funds were used only for the procurement of the necessary technology manufacturing equipment. Because of the lack of necessary competences and skills among the local manufacturing companies, the project plan for the cell-production engineering-technological process was designed by a foreign enterprise (ECP Holland BV).

Anticipation and management of the impact of green change on quantity and quality of jobs

Impact on quantity of jobs

The development of BSE operations will have direct impact on employment. Currently, the company has 14 employees – 12 existing jobs were transformed and two new green jobs were created. In the next five years the company expects to create about 116 new jobs.

According to company's tentative forecasts on the structure of positions after its full green restructuring, in five years about 80% of the company's employees will be newly employed specialists working in the area of PV technologies. It is not envisaged that any of the current positions will be eliminated. Most of the new employees will belong to the category of technical/engineering staff (engineers, technicians-researchers, operators, technical supervisors), while the administrative/financial personnel are anticipated to constitute only 20% of the company's employees. These approximate figures on growth in the number of employees and on the company's future structure of positions are based on the technical recommendations provided by the suppliers of technical equipment (Singulus Technologies AG).

The most serious obstacle that might impede successful implementation of green change in the company is the difficulty of attracting and retaining employees with the necessary skills and qualifications. The biggest threat is the possibility of skilled employees leaving the company for better-paid positions in the competing western European companies. There was already one case of a masters student who was expected to return to work for BSE after his training period in Germany, but decided instead to continue his PhD studies in Germany, and who has probably been offered an employment contract with a German company.

Impact on quality of jobs

Skills development

In terms of the qualitative developments of skills used in the PV cells production process, the green change in the company poses a demand for new jobs with different types of skills and qualifications. The main reason for this is that the PV technologies industry requires specialists who have a broader spectrum of skills and knowledge than those involved in the production of optical devices. Currently there is a lack of qualified solar energy specialists in Lithuania, and in the future the company will have to invest more to acquire professionals with the necessary skills in this field. Since part of the process of the production of PV cells will be new and completely different from any previous practices used in the company, the acquisition and development of technical/engineering and research skills will be the most important element in the successful implementation of selected green practices. In particular, the development of the following relevant skills and competences will be of primary importance for the company:

- good knowledge and work skills with chemical materials;
- automotive production line management skills;
- mechanical and engineering skills.

It is anticipated that all the technical, engineering and research staff working in solar cells production will need to have at least undergraduate-level education in their respective field of specialisation. While most of the Lithuanian universities provide the necessary general knowledge and skills, most of the technical and engineering employees (engineers, technicians and researchers) working for BSE, with the exception of operators and technical supervisors, will have to acquire specialised training in their respective work fields. As with the forecasts for the numbers of new jobs, the required qualifications and skills of the future employees are set out in the technical recommendations provided by Singulus Technologies AG.

BSE faces three types of obstacles related to green skills. Firstly, there are no training providers in Lithuania that could provide the required skills in areas such as R&D, manufacturing process and engineering. Secondly, the financial resources of companies starting new green practices limit the possibility of training people abroad. Finally, masters-level studies are overly theoretical in Lithuania and do not provide students with the necessary practical skills. In response to these obstacles, BSE is applying the following four approaches to develop the necessary skills of its employees.

- **Training students abroad**: The company has signed a mutual cooperation agreement with three Lithuanian universities (Vilnius University (VU), Kaunas Technology University, and Vilnius Gediminas Technical University (VGTU)). According to this agreement, so far three top masters students have been granted an opportunity to get the advanced one-year training in PV technologies in Germany. After the training period is over, these students would be obliged to come back to Lithuania to become employees in the BSE research and manufacturing centre. In 2013 the enterprise is planning to extend the agreement and to send between one and three further Lithuanian students to Germany for training in the PV technologies production process. In addition, one BSE employee participated in a three-week study visit to India.
- **Co-creating a two-year PV energy engineering masters study programme:** This has been initiated by few Lithuanian companies, including BSE and VGTU. The study programme was launched in autumn 2011. It is anticipated that a significant share of the graduates of this programme will be granted internships in BSE and, afterwards, jobs.
- **Delivering informal training programme based on collaboration within the Lithuanian PV Technology Cluster (LPTC):** Companies in LPTC have agreed to collaborate when up-skilling and training their employees. For example, a few employees from BSE did internships at the Precizika Met SC, another Lithuanian company having a functioning industrial research laboratory. The same people had previously benefited from the mobility visits in Germany, thus they shared their knowledge with the Precizika Met SC. Companies agreed with the Lithuanian universities (VU, VGTU) to accept students for internships, to allow access to laboratories and equipment for studies.
- **Providing the necessary internal practical training for its new employees:** This way of developing the necessary skills is especially effective, because it will mainly focus on training the technical and engineering personnel to work with the specific technical equipment, which will be used in the process of the production of PV cells in the company. BSE even has plans to establish a training company to train the employees and to provide training services to other companies.

Other working conditions

In addition to the investments in the training of professionals, these new green technology specialists will have higher salaries than the rest of company's employees. In terms of working time, no major changes are anticipated, because the enterprise already has a very flexible time management system. Other working conditions and social guarantees, offered for future employees working with the green practices, will probably be no different from those provided to current employees. No major changes in the area of workplace safety are anticipated either, since the health and safety of the employees will remain one of the top priorities of the enterprise's strategy.

Role of public authorities

BSE strongly emphasises the role of public authorities in supporting company's successful shift to green business practices. Firstly, the legal framework for the alternative energy sources market has to be created in Lithuania. Secondly, financial support provided by various state funds and EU funding is especially helpful, since the company alone would not be able to cover all the financial costs related to R&D and the necessary up-skilling and training of the company's employees.

BSE is already actively using new opportunities provided by structural funds for the development of commonly used research and manufacturing facilities and training programmes, and collaborates with other local partners. The partners along the value chain, including BSE, concentrate around the LPTC.

LPTC started its operations in 2008 and currently brings together solar technology producers and research and education providers in the country. BSE actively participates in two ESF/ERDF funded projects launched by the LPTC. In the course of these projects, the masters studies programme described above was launched and commonly used technical base facilities for solar technology development and research were constructed.

Finally, the state could also support the greening business process in an indirect way, by promoting more practically-oriented higher education programmes. Lithuanian higher education institutions currently provide good, but over theoretically-oriented knowledge, which is very often inapplicable in real business practice. A shift to more practical and green business-oriented higher education might be achieved by including students' research work in laboratories and/or compulsory work experience (internships) in private companies.

Conclusions and recommendations

- The case study illustrates the company's shift to the production of solar cells driven by exploration of new business opportunities, but also supported by foreign partners, government, providing public funding, and local partners.
- The green restructuring in the company will be accompanied by a vivid expansion in the number of (green) jobs: after full restructuring roughly 80% of the company's jobs will be newly created roles and will offer better salaries than the company's traditional work places.
- The shift to the PV technologies sector will require the acquisition and development of new green skills, among which technical/engineering skills will be of paramount importance. The company, with the help of German partners, has actively anticipated the new skills needs and planned measures to manage the demand for them. It plans to train local students abroad; it is co-initiating a masters study programme; and it is providing practical internal as well as informal training opportunities for its employees inside the company.
- The principal obstacles for successful green change in the company, however, are still closely related to the lack of specialists with the necessary skills. Active financial support for re-skilling and training of employees at both European and national levels would help to manage green change in the company. In addition, promotion and support of more practically-oriented study programmes (inclusion of work practice and/or laboratory work) by public authorities would also contribute significantly to the successful management of green change processes.
- Collaboration efforts in the anticipation and management of both the development of green business practices and green skills are stronger when SMEs, and not large companies, are behind the development of emerging industry sub-sectors.
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