PISM | POLSKI INSTYTUT SPRAW MIĘDZYNARODOWYCH
THE POLISH INSTITUTE OF INTERNATIONAL AFFAIRS

BULLETIN

No. 4 (599), 13 January 2014 © PISM

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Export of Environmentally Sound Polish Technologies to Non-European Markets

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The ongoing international discussion on climate change and its adverse effects on the environment and the global economy has boosted worldwide demand for so called green technologies. This trend will likely be sustained in the long term as doing so could enhance an economy's competitiveness through such things as better usage of natural resources and saving energy. Polish companies should be active in the field of environmentally sound technologies, particularly those concerning renewable energy sources (biomass, solar power) and improving energy efficiency. Polish authorities and business organisations should support entrepreneurs in especially accessing non-European emerging markets, which are less saturated than the developed countries.

The importance of low-carbon environmental goods and services (LCEGS) in the world's economy has been steadily rising in recent years. Global sales of LCEGS amounted to about €4 trillion in 2011/2012 (according to a 2013 report by the UK Department for Business, Innovation and Skills) and recorded an annual growth rate of 3.8%. This trend should continue in the coming years—the value of LCEGS trade is projected to rise by about 4% annually to 2015. Currently, the world's biggest LCEGS markets are the United States (19% of total sales), China (13%), and Japan and India (6% each). Demand for environmentally sound technologies could especially rise in developing countries as they are going to allocate considerable funds for modernisation, urbanisation and tackling energy poverty.

Environmentally sound technologies currently play a marginal role in Polish exports. However, every year there are more and more Polish firms active in the green technology industry. In 2011, more than 500 Polish companies were active in the environmental technologies sector, of which more than 300 were recognised as producers. Given the still insufficient demand on the domestic market, they often pay more attention to attractive foreign markets. Polish green technology exports are strongly backed by the GreenEvo project of the Polish Ministry of Environment. However, for Polish companies, a presence on foreign markets entails competition or cooperation with world leaders in specific segments, e.g., in biomass (against leading firms from Germany or Sweden), solar power (those from China or Spain) or in energy efficiency (firms from Germany and the U.S.).

Renewable Energy Sources—Biomass and Solar Power. Among the available renewable energy technologies, Polish companies can offer manifold solutions related to biomass. This has traditionally been the main source of energy for around 2.5 billion people in Asia and Africa. As modern technologies are now needed, it is the fastest growing sector of the renewable energy industry worldwide as installed power capacity could rise from nearly 60 GW in 2013 to 82–130 GW by 2020. Significant growth is predicted in Asia, Sub-Saharan Africa and Latin America. The most popular technologies in this sector are biomass gasification, combustion and co-firing with coal, which are methods that have been developed by some Polish companies (H. Cegielski, which develops biogas plants). Several companies (such as Asket or Ursus) provide briquetting machines for hay and straw and are also interested in expansion onto foreign markets.

So far, Polish companies have experience in the export of biomass technologies to the EU (e.g., Germany) but they should also strive to find attractive destinations beyond Europe. The forerunners of this are already active in Africa and South and Southeast Asia—Asket has recently concluded contracts in Vietnam and Tanzania. In this context, India, the developing world's biggest CO_2 emitter as coal contributes to 60% of electricity generation, could be an especially

attractive destination. Given the growing energy demand there and frequent electricity shortages, the Indian energy sector must be modernised in the coming years. Domestic biomass-power-consumption potential is estimated at around 18–23 GW, while installed capacity is six times less. Moreover, there is easy access to biomass, with production amounting to 450–500 million tonnes. Another prospective market could be South Africa, where about 80% of electricity production is derived from coal. The country's demand for coal has been steadily rising (over 20% in the last decade), but the supply is insufficient. To prevent blackouts, the country will need to install capacity for at least an additional 40 GW, mostly coal-based generation, by 2030 (nearly doubling its current capacity). South Africa's trump card is its wide access to biomass, i.e., from paper waste and crop by-products. Furthermore, such exports should be facilitated by the existing EU–South Africa free trade agreement.

Another promising sector is solar power. International Energy Agency (IEA) data show that investment in solar power amounted to more than $140 billion in 2012. IEA predicts that by 2050 worldwide solar energy capacity could approach 3,000 GW and account for 20–25% of the world's electricity production. The market for photovoltaic panels, which are used to produce electricity, is growing particularly rapidly—in 2012, this segment's total capacity grew by 31 GW (a 42% annual rise) to reach 102 GW. Yet, for Poland, the majority of the 70 or so companies active in the solar energy sector specialise in the production of solar collectors, which are used for heating.

Polish companies (such as Watt, Hewalex or Sunex) export half of what they produce, which last year amounted to 62,000 m^2, but mainly to EU countries. IEA indicates that the reduction of solar installation costs will boost demand in Africa, Asia and Latin America. For instance, consulting company Frost & Sullivan has pointed to Brazil as one of the most prospective markets, a place where the solar technologies sector amounted to $29.3 million in 2012 and where it will rise to $431.1 million by 2017 (with 71% annual growth). This soaring market will be driven not only by the infrastructure boom associated with the FIFA World Cup in 2014 and the Olympic Games in Rio de Janeiro in 2016 but also due to significant government incentives, such as tax relief for solar energy producers. Polish companies should also closely watch market opportunities in other parts of the world, e.g., in Southeast Asia where Thailand is planning to triple its solar power capacity to 3,000 MW in the next seven years and where local energy companies will invest up to $2 billion over the next five years.

Energy Efficiency. The constantly rising popularity of environmentally friendlier technologies is based on the increasingly common perception that they are crucial to enhancing an economy's competitiveness. These technologies are used in numerous sectors, such as construction, transport, and industry (e.g., food, pharmaceuticals, metallurgy) as well as power generation. According to IEA calculations, the usage of various kinds of energy efficiency technologies could halve energy demand growth by 2035.

The energy savings technology market is rapidly growing. Some estimates (i.e., those provided by BCC Research) indicate the value of this market will increase from $200 billion in 2010 to about $312 billion in 2015. Currently, world leaders come from Western European countries (e.g., Germany), the U.S. and Japan. However, Polish companies are competitive in several niches, including the passive house market, such as firms Izodom and M3SYSTEM, which estimate the global market will reach about $40 billion by 2015. Moreover, Polish firms offer solutions for energy savings in road infrastructure and public buildings (e.g., Lediko, Apanet, Promar) or efficient air conditioning and ventilation systems (e.g., Frapol, Nikol). Polish companies have started to interact with non-European markets at a relatively small scale, for example, Izodom has signed a contract to build 20 houses in Zambia (Lusaka). In the future, opportunities could present themselves in other markets, including in Africa, South America, and southern and eastern Asia (especially China, where several energy efficient programmes, such as those for industry, have already been implemented), as well as in the Middle East.

Conclusions and Recommendations. Polish companies should seize the export opportunities that have emerged in non-European countries, especially in biomass, solar collectors and energy efficiency technologies. Furthermore, other environmentally sound technologies that are "made in Poland," such as water and wastewater management systems, waste management or air-protection solutions are able to compete in international markets.

However, Polish firms ought to be well prepared to act globally. They should get to know the needs and characteristics of their foreign partners and their particular markets. It will be useful to focus on the concrete benefits of Polish technologies and be in compliance with domestic regulations. Firms should also increase their flexibility to be able to adjust their products to local conditions.

Moreover, financial instruments such as export credits could reduce business risk when doing business with partners from markets that are not well known in Poland. In order to choose a credible contractor or distributor in these exotic markets, the firms should use the services of credit information agencies. Government institutions and Polish diplomats should support green technology exports, at least by providing market information and counteracting restrictions on Polish goods. Moreover, a green technologies promotional campaign in international business media, supported by government business-development funds, should be pursued.