

CROATIA



Energy Technology, Systems, and Equipment

In the “community-scale” energy islands segment, firms create electrical “microgrids” for buildings or small communities. These microgrids can run independently from the main power grid. Microgrids reflect a new reality of “distributed energy,” where consumers or businesses may be both sellers and buyers of energy.

Opportunities for Croatia may lie in harnessing the country’s capacities in energy technology to combine the component systems of microgrids. Croatian firms could then deliver integrated solutions to customers.



Industry Snapshot

The global energy sector is huge. Worldwide, the energy sector (energy technology, systems, and equipment) is worth EUR 887 billion and growing.

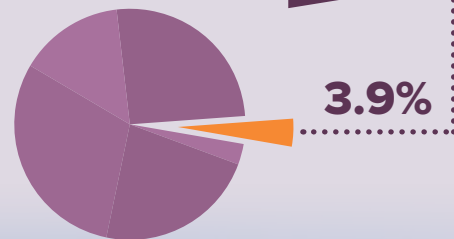
The energy sector accounts for a substantial proportion of Croatia's economy. Firms in energy industries employ several thousand people directly, out of a total of 1.1 million jobs in Croatia's economy. Energy-related manufacturing firms produce EUR 2 billion of output, which is 3.9 percent of all private sector activity in Croatia. The energy sector in Croatia consists of 1,000 manufacturing companies and an indeterminate number in services.

Croatian energy firms are having trouble maintaining their revenues internationally.

Energy firms accounted for 7.6 percent of Croatia's total exports, valued at EUR 868 million, in 2015. However, Croatia's energy exports shrank at 0.9 percent annually from 2007 to 2015.



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Emerging Strategic Segments



Emerging energy strategic segments focus on ‘energy islands.’ Energy islands are small, geographically discrete grid networks, such as microgrids. The products in these strategic segments include energy generation and the control systems to facilitate it. These ‘smart’ technologies smooth consumption over time and respond in real time to energy availability and prices.

The energy island strategic segments have two main markets: communities and buildings. The “community-scale” market is for energy products and services at the scale of cities, districts, and national grids. The “building-scale” market is for energy products and services for individual households, small retail establishments, and commercial and industrial establishments.

The value chain differs between the “community-scale” market and the “building-scale” market. The “community-scale” market seems to offer better opportunities.

“Community-scale”

Products and Services Catering to Cities, Districts, and National Grids

The “community-scale” strategic segment is more desirable as a target market for Croatian firms:

- *At larger scales, the threat of rivalry is low.* Providing energy solutions on a community level requires economies of scale, access to infrastructure, and legal savvy. Systems integration creates the potential for new barriers. The complexity of smart grid and energy monitoring systems requires a high level of sophistication. Thus, opportunities exist in smaller markets such as university campuses, industrial zones, and residential neighborhoods.
- *Producers will have advantages relative to buyers.* Microgrid solutions are, by nature, highly differentiated and often procured on a one-off basis. These characteristics improve the ability of energy equipment, technology, and systems producers to negotiate with buyers rather than face price competition alone.



“Building-scale”

Catering to Individual Households, Small Retail Establishments, and Commercial and Industrial Establishments

The building-scale strategic segment, by comparison, is less desirable:

- *The threat of rivalry is higher.* Household-scale solutions for energy generation and storage will become increasingly standardized as the size of the market increases. There is no intrinsic barrier to firms entering this strategic segment, and the competitive landscape is becoming more crowded. Solar panel installers, for example, are already common, and solar panels themselves have become commodities where small firms will find it almost impossible to differentiate their products and make profits.
- *Buyers tend to be well-informed and able to negotiate on price.* Buyers in the emerging building-scale energy island strategic segment tend to be well informed about what they need. ‘Grid-dependent’ remains the default option while ‘grid defection’ (i.e. becoming independent of the electricity grid) requires more ingenuity.



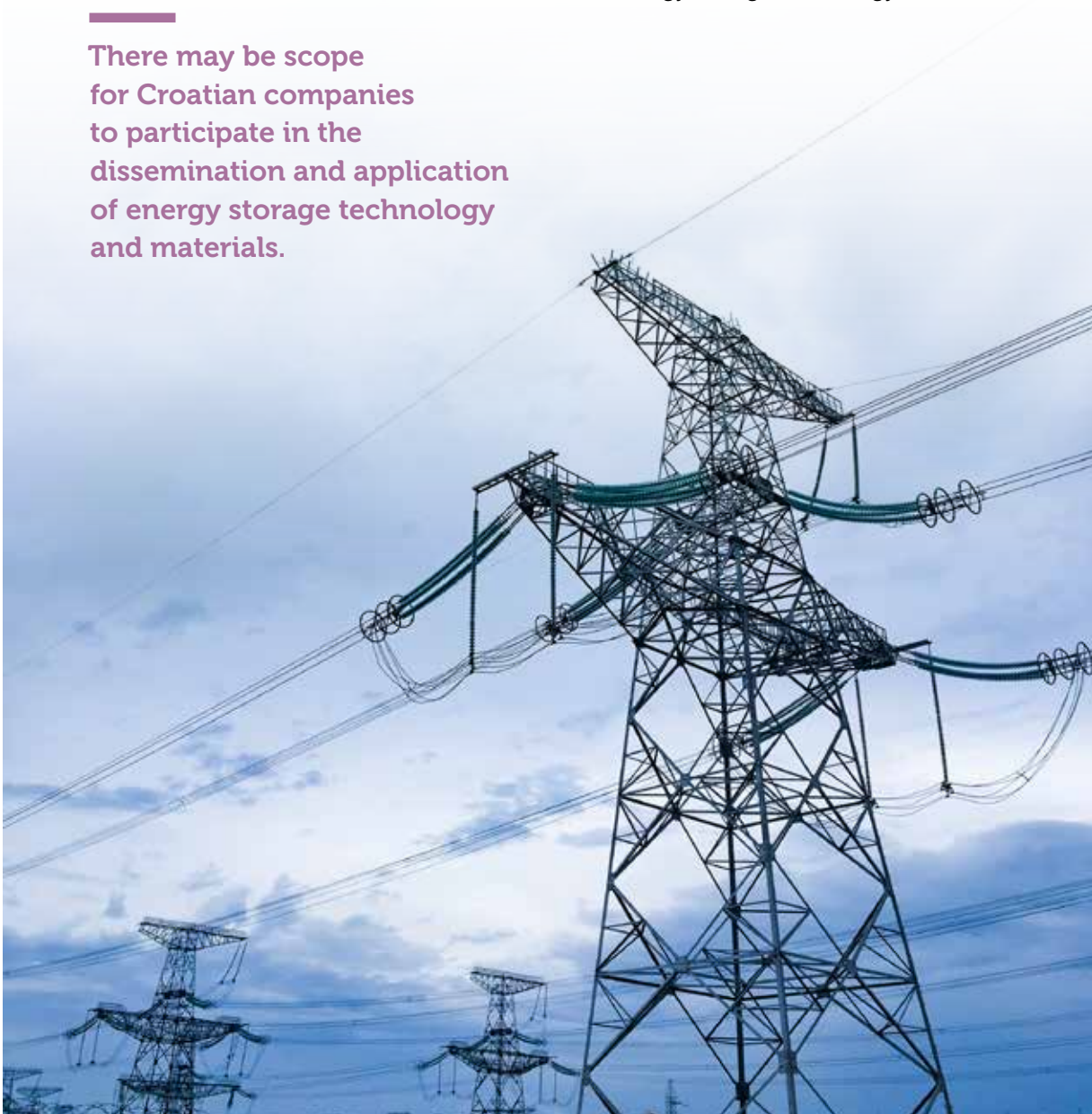
Where Is the Value Chain Weak?

Two gaps in the energy value chain limit Croatia's competitiveness:

- *Croatian firms do not supply user-friendly systems integration solutions.* Emerging strategic segments require integrating energy management systems with long-term after-sales service and maintenance. Croatia lacks systems that allow this integration. Few Croatian firms have the highly technical expertise needed for this strategy.

- *Energy storage is a notable gap in the Croatian value chain.* In the global energy storage sector, manufacturers typically cater to firms employing global, multiproduct strategies. This is a sector where Croatian firms might benefit from a niche differentiation. Battery storage technologies are relevant, but other technologies such as the exploitation of thermal energy storage systems play a larger role in this strategic segment. There may be scope for Croatian companies to participating in the dissemination and application of energy storage technology and materials.

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Areas for Reform

To improve its competitiveness in strategic segments, Croatia needs to strengthen parts of its energy industry ecosystem:

Demand Conditions

Reaching the larger EU market requires establishing a strong domestic market. The size of the EU market gives Croatian firms an advantage. Croatian firms also have traditional links to markets in neighboring countries outside the EU, such as Bosnia and Herzegovina and Serbia. Cultivating a strong domestic market would aid with expansion into neighboring countries.

Factor Conditions

Croatia offers low wages, but also lower labor productivity. Croatia's labor force is available at lower wages than its neighbors, but labor productivity is also low. Worryingly, real wages are increasing faster than productivity: from 2000 to 2014, productivity increased by 20 percent while real wages increased by more than 70 percent.

Croatia may lack adequate human resources. The number of Croatian engineering graduates is small. In 2013, 5,300 students completed a degree in an engineering field, and 2,900 in sciences, math, and computing.

Access to finance is limited. Many firms in the energy industry express difficulties with the cost of capital and note that companies in other countries have more favorable terms. However, the cost of capital for renewable energy technologies is declining. The weighted average cost of capital for wind and solar energy dropped by 3.9 percent between 2014 and 2016. The risk premium for wind and photovoltaic energy in Croatia is 10.3 percent—considerably higher than in Bulgaria and Romania, where it stands at 6.5 percent. Thus, difficulties accessing finance in Croatia may lie more in the perceived risk in the energy sector than in overall constraints on access to finance.

Strategy, Structure, and Rivalry

Croatia lacks a platform for collaboration among disparate firms. The Croatian energy sector consists of disparate firms engaged in vastly different activities. They do not have a common platform for collaboration and cooperation.



Recommendations

Specific actions could improve Croatia's competitiveness in strategic segments:

1.

Creating microgrids. Croatian islands are ideal for microgrids. Agencies that might be involved include municipalities, regional authorities, and the national power company, Hrvatska elektroprivreda (HEP). Implementation of this recommendation would be supported by a comprehensive financial support scheme for public procurement of innovative goods and services (as a technical assistance program for line ministries).

Estimated timeframe: 7–10 years.

2.

Running a testbed pilot to create a microgrid system to which Croatian companies would supply components. Croatian firms could then export the integrated solution. The testbed could be located on a Croatian island and emphasize off-grid or single-connection microgrid systems that can be easily deployed and exported. Relevant line ministries or government corporations could run the pilot through a public procurement.

Estimated timeframe: 3 years.

3.

Running an innovation competition to help find the most suitable partners to take part in a testbed pilot. MoEEC could implement this recommendation as prize financing.

Estimated timeframe: 2 years.

4.

Configuring substations for microgrids (within microgrids and between microgrids and the main grid). The Ministry of Economy Entrepreneurship and Crafts (MoEEC) could implement this recommendation as a matching grants program.

Estimated timeframe: 7–10 years.

5.

Conducting technology scouting to find the best providers for the complex components and technologies in the new energy systems. This would also help match innovative technologies with industry requirements. MoEEC could implement this recommendation as a matching grants scheme.

Estimated timeframe: 3 years.

6.

Conducting market intelligence studies on (1) product segmentation within micro and smart grids and the market size for each; (2) technical requirements for suppliers entering micro and smart grid markets; and (3) appraisal of upgrading costs for Croatian manufacturers. MoEEC and other relevant agencies could implement this recommendation through private sector firms.

Estimated timeframe: 5 years.

7.

Conducting precompetitive missions to target markets where Croatian firms seek to establish commercial relationships for providing community energy solutions. Trade missions could target buyers in remote locations. MoEEC and other relevant agencies could implement this recommendation through public institutions, government agencies, and the private sector.

Estimated timeframe: 5 years.

8.

Providing financial security to encourage Croatian firms to begin developing innovative export products. Participating in foreign tenders requires organizing firms because solutions rely on complementary markets and the products or services of many suppliers. MoEEC could provide coordination services and guarantees to cover the cost of bidding for foreign tenders.

Estimated timeframe: 5 years.

NOTE

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