

Croatian Wind Power Market

Summary and main findings

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The main aim and data sources

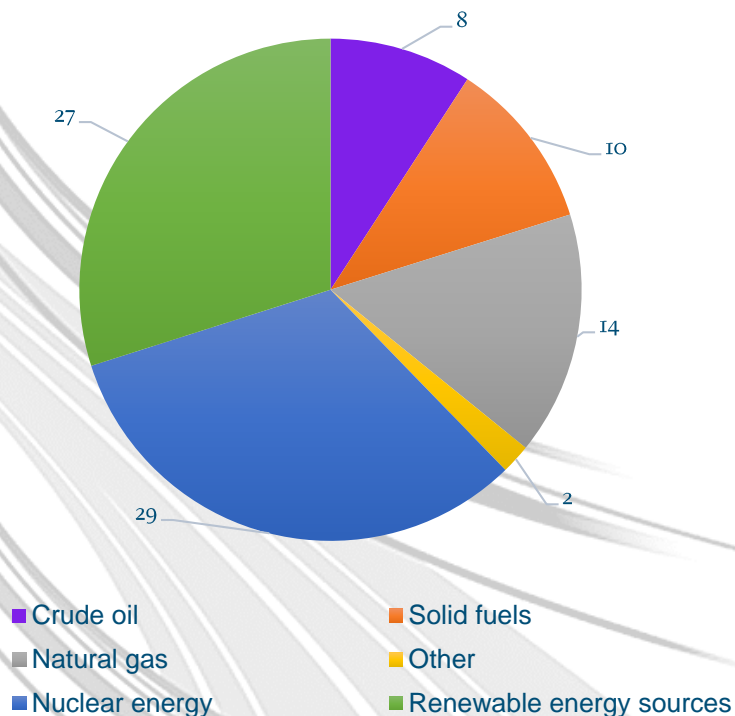
- ❑ The main aim of this paper is to analyse the wind power production market and to assess the financial position of companies engaged in this activity
- ❑ The main source of data: Annual financial statements of companies
- ❑ Analysis includes time period 2010-2016

Renewable energy sources

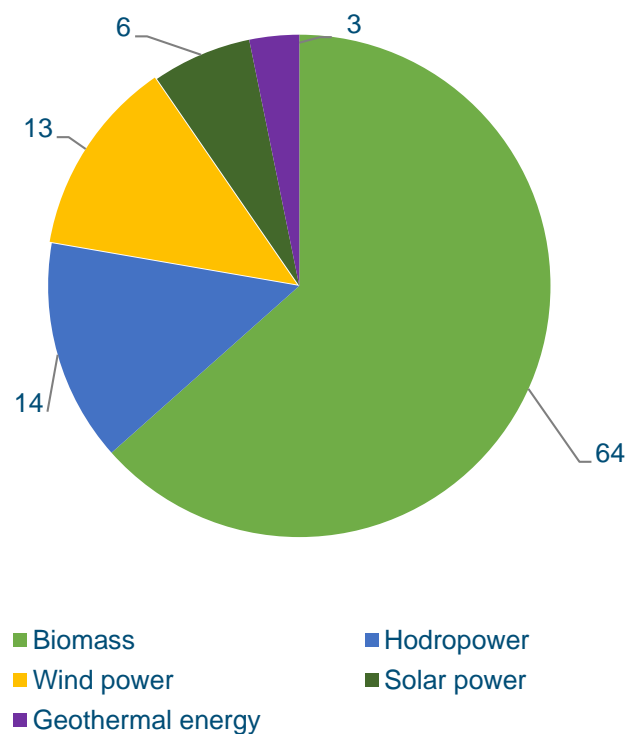
- ❑ Renewable energy sources have been replacing fuels and contributing to the reduction of greenhouse gas emissions, diversification of supply and reduction of the dependence on unreliable and unstable fossil fuel markets – in particular the oil and gas market
- ❑ A significant piece of legislation is Directive 2009/28/EC, which lays down mandatory national targets for the overall share of energy from renewable sources in gross final energy consumption and for the share of energy from renewable sources in transport. Such mandatory national targets are in line with the EU objective until 2020
- ❑ Meeting the target of:
 - at least 20% of renewable energy sources in the gross final energy consumption and
 - 10% of transport fuel production from renewable sources

Renewable energy sources in EU

Total energy production in EU-28 in 2015 (in %)



Share of individual renewable sources in total energy production from renewable sources (in %)



Source: Eurostat (2017)

Wind power generation and consumption in the EU from 2010 to 2016 (in TWh)

| Year | Consumption | Generation | % of wind power generation in total consumption |
|------|-------------|------------|---|
| 2010 | 3,415 | 181 | 5.3 |
| 2011 | 3,328 | 204 | 6.3 |
| 2012 | 3,300 | 231 | 7.0 |
| 2013 | 3,280 | 257 | 7.8 |
| 2014 | 2,798 | 284 | 10.2 |
| 2015 | 2,770 | 315 | 11.4 |
| 2016 | 2,860 | 296 | 10.4 |

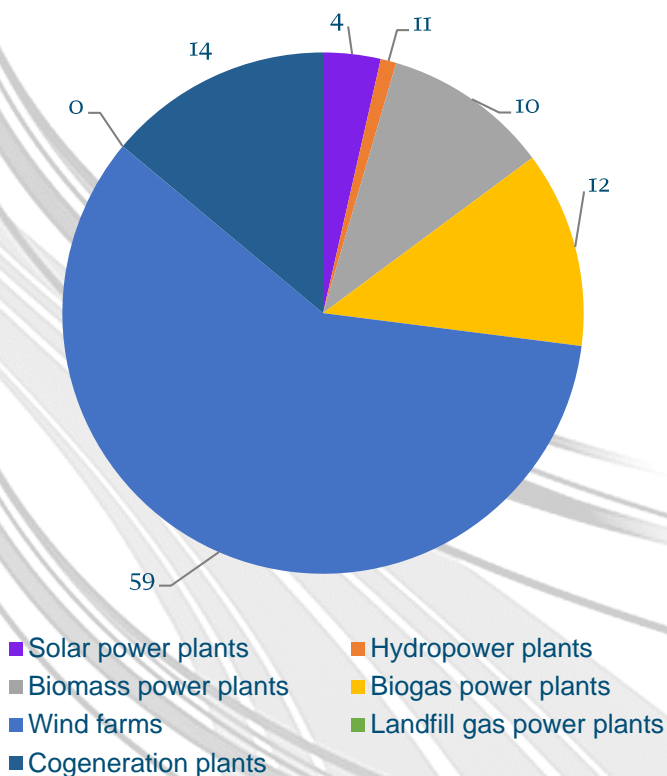
Source:
Authors' calculations
based on data from
WindEurope (2017)

Wind power generation and market in Croatia

- ❑ In the Republic of Croatia, wind power generation has increased by 15 times, from 0.067 TWh in 2010 to 1.01 TWh in 2016
- ❑ The share of wind power generation in total electricity production increased from 0.5% in 2010 to 9% in 2016, while the share in total consumption increased from 0.4% to 5.7%
- ❑ One of the reasons for such expansion are the state financial incentives for renewable energy production, as wind farms belong to a group of eligible electricity producers

Renewable energy sources in Croatia

Overview of shares in the electricity production of eligible producers in 2016 by technology (in %)



The volume of electricity trade and production in Croatia from 2010 to 2016

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Average |
|---|-------|------|-------|-------|-------|------|-------|---------|
| Consumption (in TWh) | 17.9 | 17.7 | 17.5 | 17.3 | 16.9 | 17.6 | 17.7 | 17.5 |
| Total production (in TWh) | 13.26 | 9.9 | 9.897 | 12.79 | 12.19 | 9.99 | 11.33 | 11.35 |
| Wind power production (in TWh) | 0.07 | 0.19 | 0.3 | 0.46 | 0.72 | 0.78 | 1.01 | 0.5 |
| Share of wind power production in total production (in %) | 0.51 | 1.90 | 3.03 | 3.59 | 5.91 | 7.80 | 8.91 | 4.52 |

Wind power market in Croatia (1)

- ❑ The wind energy market in Croatia is dynamic and still developing. In the period from 2010 to 2016, wind power generation has increased by 15 times. One of the reasons are high prices at which HROTE purchases electricity from eligible producers
- ❑ The average electricity price in 2015 paid to eligible producers in the incentive system was three times higher than the annual average of electricity prices on the power exchange closest to Croatia (Slovenian - BSP and Hungarian market - HUPX)

Wind power market in Croatia (2)

- ❑ Total newly installed capacity not yet in operation amounts to 326 MW, which is around 80% of the current capacity of active wind farms. In 2018, the company C.E.M.P. will become the largest individual wind power producer in Croatia
- ❑ Wind farms employ a minimal number of employees as this activity is very capital-intensive, with no particular need for a workforce, and usually have one employee (commonly a director), while some have no employees at all

Wind power market participants in Croatia (1)

| Producer | Plant/ wind farm | Installed capacity (MW) | Location (county) | Wind turbine manufacturer |
|--------------------------|-----------------------------------|-------------------------------|-------------------|------------------------------|
| Aiolos projekt | Ogorje | 42 | Split-Dalmatia | Vestas |
| Crno brdo | Crno Brdo | 10 | Šibenik-Knin | Leitwind |
| Eko - energija | Zelengrad Obrovac | 42 | Zadar | Vestas |
| Eko | ZD2 | 18 | Zadar | Siemens |
| Eko | ZD3 | 18 | Zadar | Siemens |
| Eko Zadar dva | ZD4 | 9 | Zadar | Siemens |
| Jelinak | Jelinak | 30 | Split-Dalmatia | Acciona |
| Končar-obnovljivi izvori | Pometeno Brdo | 17.5 | Split-Dalmatia | Končar |
| Končar-obnovljivi izvori | Pometeno Brdo (Reconstruction) | 2.5 | Split-Dalmatia | Končar |
| Orlice | Orlice | 9.6 | Šibenik-Knin | Enercon |
| Oštra stina | ST1-2 | 20 | Split-Dalmatia | Siemens |
| Oštra stina | ST1-2 | 20 | Split-Dalmatia | Enercon |
| Ponikve | Ponikve | 34 | Dubrovnik-Neretva | Enercon |
| RP Global Danilo | Velika glava, Bubrig and Crni vrh | 43 | Šibenik-Knin | Enercon |
| Rudine | Rudine | 34.2 | Split-Dalmatia | Enercon |
| Selan | Vrataruša | 42 | Lika-Senj | Vestas |
| Trtar-Krtolin | Trtarkrtolin | 11.2 | Šibenik-Knin | Enercon |
| Velika popina | ZD6 | 9 | Zadar | Siemens |
| Total | | 412 | | |

Source:
Authors' representation, based on data from: HROTE (2017)

Wind power market participants in Croatia (2)

- ❑ In the Republic of Croatia, there are 22 eligible producers who have concluded electricity purchase contract with HROTE under Tariff System, where 15 of them are operational and 7 companies have not yet commissioned their plants
- ❑ Out of 22 companies fifteen are in foreign and seven in domestic private ownership. All are registered as limited liability companies
- ❑ As much as 41% of the total capacity is accounted for by Vrataruša, Zelengrad Obrovac, Ogorje, Velika glava, Bubrig and Crni vrh. All wind plants are located in the coastal area of only five counties

Basic information on active wind plants in the Republic of Croatia in 2016

| Producer | Founded | Commissioning date | Number of employees | Share capital (in thousands of HRK) | Owner |
|--------------------------|---------|--------------------|---------------------|-------------------------------------|-------------------------------|
| Aiolos projekt | 2005 | 2005 | 0 | 24 | Ogorje green |
| Crno brdo | 2006 | 2016 | 1 | 10,703 | Orient green power |
| Eko -- energija | NDA | 2015 | 1 | 74 | Silent meteors |
| Eko | 2001 | 2000 | 8 | 20 | Dalekovod professio |
| Eko Zadar dva | 2007 | 2013 | 1 | 60 | Vladimir Matjačić |
| Jelinak | 2002 | 2014 | 1 | 91,020 | Acciona Energia Internacional |
| Končar-obnovljivi izvori | 2008 | 2008 | 4 | 130,312 | Končar- KET d.d. |
| Orlice | 2006 | 2009 | 0 | 20 | WPD Europe GMBH |
| Oštra stina | 2011 | 2013 | 3 | 20 | Iljko Ćurić |
| Ponikve | 2006 | 2013 | 0 | 20 | WPD Europe BMBH |
| RP Global Danilo | 2007 | 2014 | 1 | 20 | RP Global Holding Croatia |
| Rudine | 2009 | 2016 | 1 | 25 | RP Global Holding Croatia |
| Selan | 2006 | 2010 | 3 | 16,160 | Selan holding GMBH |
| Trtar-Krtolin | 2002 | 2006 | 0 | 11,182 | WPD Europe GMBH |
| Velika popina | 2005 | 2011 | 1 | 20 | Dalekovod professio |

Source:
Authors' representation, based on data from companies' financial statements and websites

Analysis of the financial position of the companies 2014-2016. (in mil. HRK)

| Company | Total revenue | | | Total expenditure | | | Net profit/loss | | |
|--------------------------|---------------|--------------|--------------|-------------------|--------------|--------------|-----------------|-------------|--------------|
| | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 | 2014 | 2015 | 2016 |
| Aiolos projekt | 1.0 | 19.6 | 78.6 | 2.0 | 21.7 | 78.3 | -1.0 | -2.1 | 0.4 |
| Crno brdo | 18.1 | 20.7 | 19.9 | 17.4 | 18.5 | 19.6 | 0.7 | 2.2 | 0.3 |
| Eko – energija | 21.0 | 76.5 | 74.9 | 45.5 | 59.4 | 66.8 | -24.5 | 17.1 | 8.1 |
| Eko | 87.5 | 92.0 | 95.9 | 95.9 | 93.7 | 87.3 | -8.5 | -1.7 | 8.6 |
| Eko Zadar dva | 17.3 | 17.7 | 18.8 | 16.8 | 17.2 | 18.8 | 0.5 | 0.5 | 0.0 |
| Jelinak | 74.0 | 68.3 | 76.4 | 60.2 | 56.3 | 53.7 | 13.8 | 12.0 | 22.7 |
| Končar-obnovljivi izvori | 22.5 | 29.4 | 27.3 | 25.9 | 32.5 | 28.6 | -3.5 | -3.1 | -1.3 |
| Orlice | 17.6 | 16.0 | 17.9 | 14.6 | 14.3 | 13.9 | 3.1 | 1.7 | 4.1 |
| Oštra stina | 81.4 | 80.9 | 83.1 | 81.8 | 79.4 | 77.8 | -0.5 | 1.5 | 5.4 |
| Ponikve | 54.6 | 46.9 | 54.2 | 50.2 | 45.9 | 44.8 | 4.4 | 1.0 | 9.4 |
| RP Global Danilo | 29.7 | 78.8 | 88.5 | 33.0 | 74.9 | 75.3 | -3.3 | 3.9 | 13.1 |
| Rudine | 0.0 | 5.8 | 79.9 | 0.5 | 7.7 | 65.3 | -0.5 | -1.9 | 14.6 |
| Selan | 84.3 | 83.9 | 101.6 | 83.3 | 71.7 | 68.3 | 1.0 | 12.1 | 33.3 |
| Trtar-Krtolin | 23.5 | 22.9 | 24.2 | 16.3 | 15.7 | 14.9 | 7.1 | 7.1 | 9.3 |
| Velika popina | 18.0 | 21.9 | 23.0 | 22.0 | 20.9 | 20.7 | -4.0 | 1.0 | 2.3 |
| Total | 550.4 | 681.2 | 864.3 | 565.4 | 629.9 | 733.9 | -15.0 | 51.3 | 130.3 |

Source:
Companies'
financial
statements

Assets, liabilities and selected financial indicators

Total assets and liabilities of active wind farms from 2012 to 2016 (in billions of HRK)

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|--------------------------|------------|------------|------------|------------|------------|
| Total assets | 2.6 | 3.7 | 4.1 | 4.4 | 4.3 |
| Current assets | 0.5 | 0.4 | 0.4 | 0.4 | 0.5 |
| Non-current assets | 2.1 | 3.3 | 3.7 | 4.0 | 3.8 |
| Total liabilities | 2.6 | 3.7 | 4.1 | 4.4 | 4.2 |
| Current liabilities | 0.8 | 0.9 | 0.8 | 0.5 | 0.4 |
| Non-current liabilities | 1.5 | 2.3 | 2.8 | 3.4 | 3.2 |
| Capital | 0.3 | 0.5 | 0.5 | 0.5 | 0.6 |

Aggregate financial ratios for 15 active eligible producers of wind power from 2012 to 2016

| | 2012 | 2013 | 2014 | 2015 | 2016 |
|----------------------------|--------|--------|-------|-------|-------|
| Current ratio | 0.62 | 0.44 | 0.50 | 0.75 | 1.10 |
| Leverage ratio | 0.87 | 0.86 | 0.88 | 0.88 | 0.86 |
| Days' sales in receivables | 164.16 | 183.14 | 85.87 | 52.94 | 50.63 |
| Net profit margin | 0.27 | 0.20 | 0.23 | 0.28 | 0.31 |
| ROA (Return on Assets) | 0.03 | 0.02 | 0.03 | 0.04 | 0.06 |
| ROE (Return on Equity) | -0.01 | -0.06 | -0.02 | 0.09 | 0.18 |

Source: Companies' financial statements

Conclusion (1)

- ❑ Wind power companies are over indebted and finance most of their assets (over 80%) from external sources (the exceptions are Trtar-Krtolin and Končar-obnovljivi izvori)
- ❑ Trtar-Krtolin, followed by Aiolos project, stand out with their good liquidity, whereas Končar-obnovljivi izvori stands out due to its illiquidity. By comparing these companies, Trtar-Krtolin has the best ratios and is an example of a successful small wind power producer
- ❑ Despite the over-indebtedness, the companies are capable of meeting their financial obligations

Conclusion (2)

- ❑ Investing in wind farms is profitable and safe, and incentives paid to eligible producers are generous and high, and concentrate on a relatively small number of market participants. Moreover, as the financing structure is dominated by external sources of finance (loans), it may be concluded that this business is relatively risk-free for the owner
- ❑ The question remains, though, why the state does not further liberalize the wind power generation and open it to new entrepreneurs. Banks are clearly ready to assume the risk of financing because they are aware of the long-term financial sustainability and profitability of these projects

Conclusion (3)

- It is not clear why the public company HEP is not actively involved in wind power generation, particularly as all this time it has been under the obligation to purchase electricity (purchased from eligible producers) from HROTE, in proportion to the market share at a regulated purchase price

Past issues

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- to contribute to the removal of administrative barriers to the development of competitiveness and the market economy

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