INSTYTUT JAGIELLOŃSKI

Overproduction from renewable sources in Poland and how hydrogen can help in solving it

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Five objectives:

1. Energy sector transformation
   - Hydrogen as energy storage
   - Hydrogen in DH production
2. Transport sector
   - Hydrogen fuelled buses (100-250 by 2025)
   - Hydrogen refuelling stations (32)
   - Hyrdogen fuelled trains
   - Aviation and maritime
3. Industry
   - Electrification and switching from fossil fuels to hydrogen in industrial heat processes
4. Production, distribution and storage
   - Low-carbon hydrogen and RES
   - UGS facilities conversion to hydrogen
   - Blending and retrofitting existing pipelines
5. Regulatory environment
   - To be finalized in 2021

Three target:

- 2 GW electrolisers by 2030
- 800-1000 hydrogen fuelled buses, 32 refuelling stations by 2030
- 5 hydrogen valleys by 2030

Energy consumption and production forecast (in accordance with the Polish Energy Policy 2040)

Consumption:

Expectation for 2025: 152 TWh

Expectation for 2030: 165 TWh

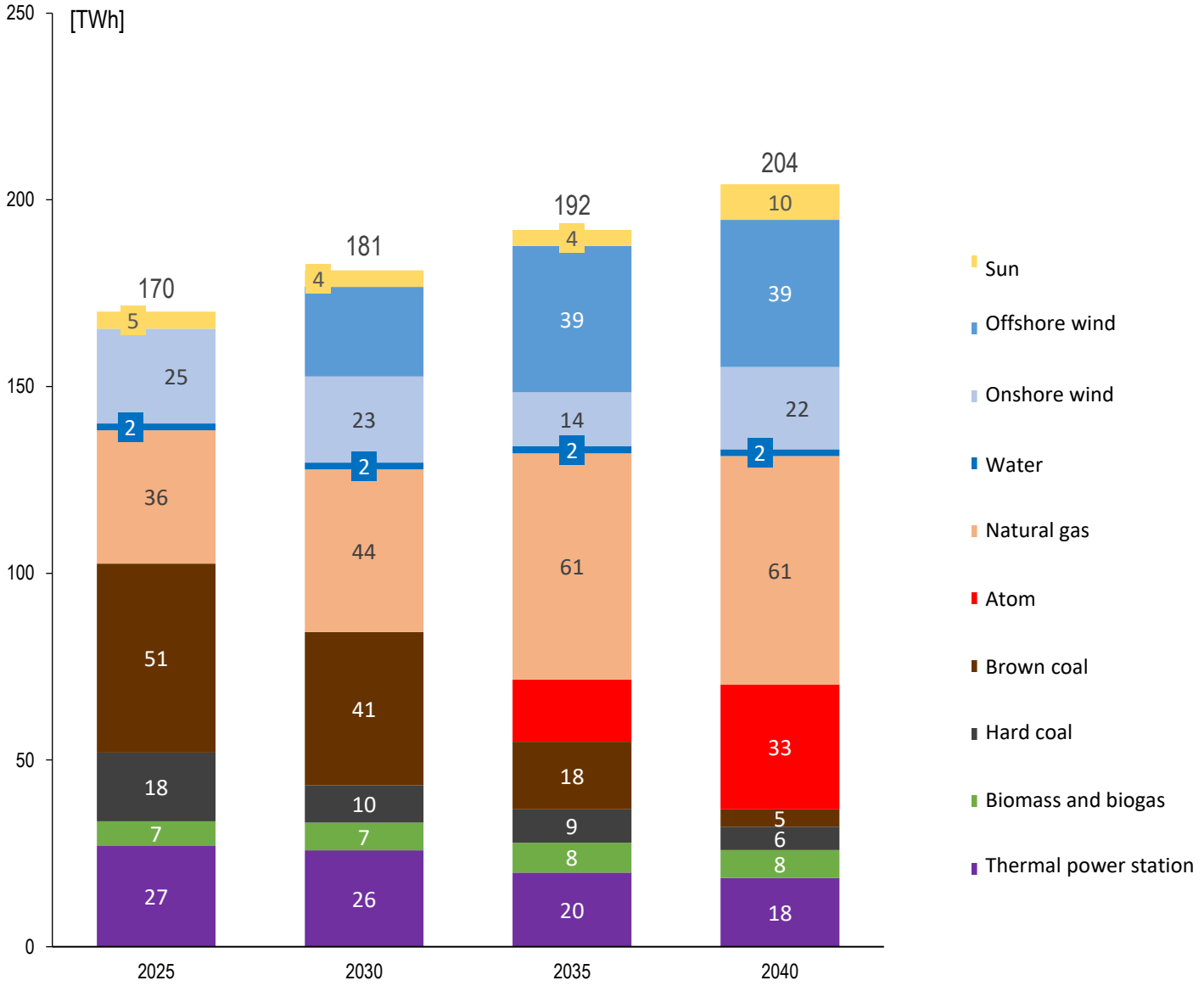
Expectation for 2040: 192 TWh

Production:

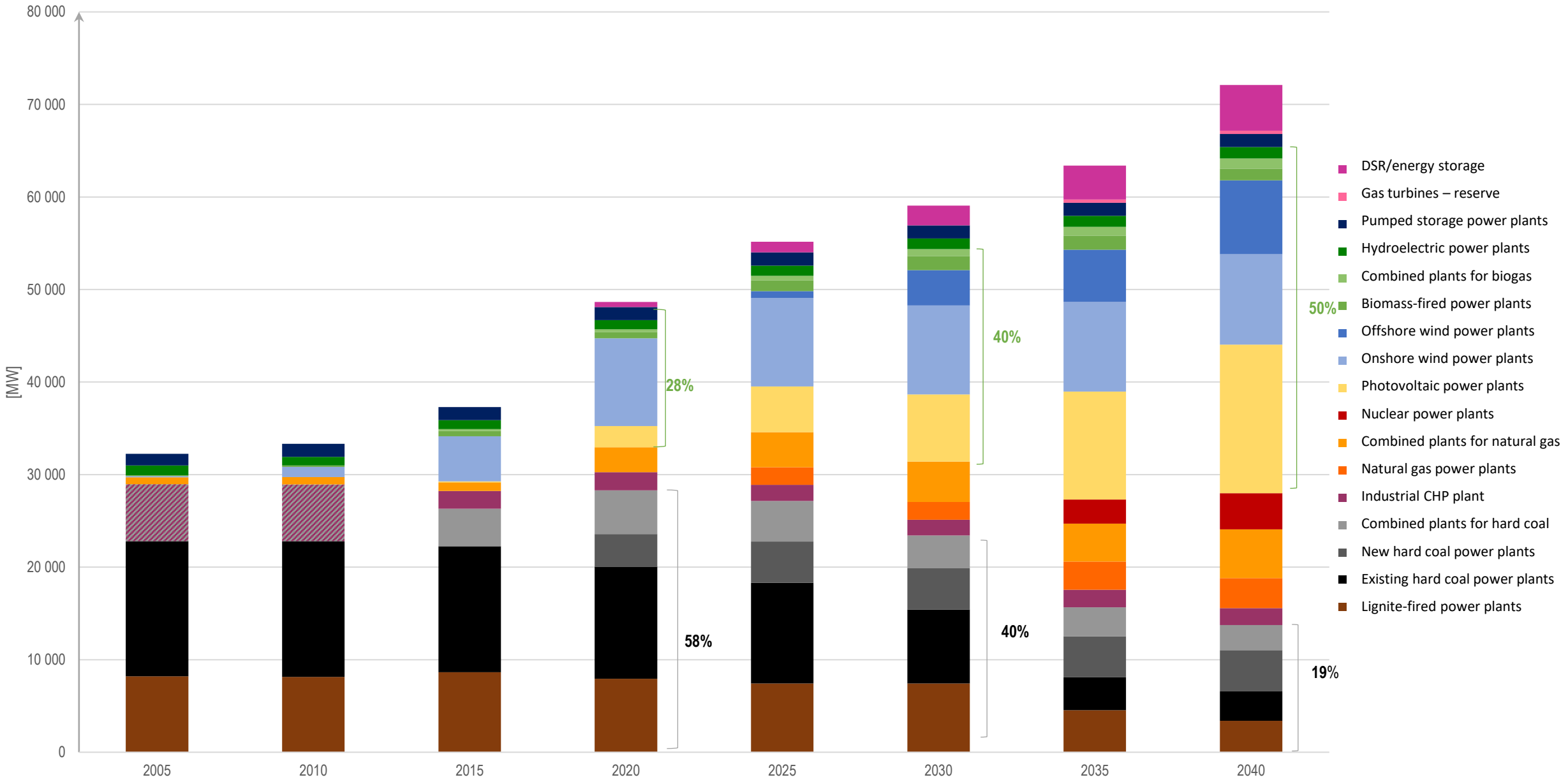
Expectation for 2025: 170 TWh

Expectation for 2030: 181 TWh

Expectation for 2040: 204 TWh



Polish energy mix – forecast (in accordance with the Polish Energy Policy 2040 – PEP 2040)



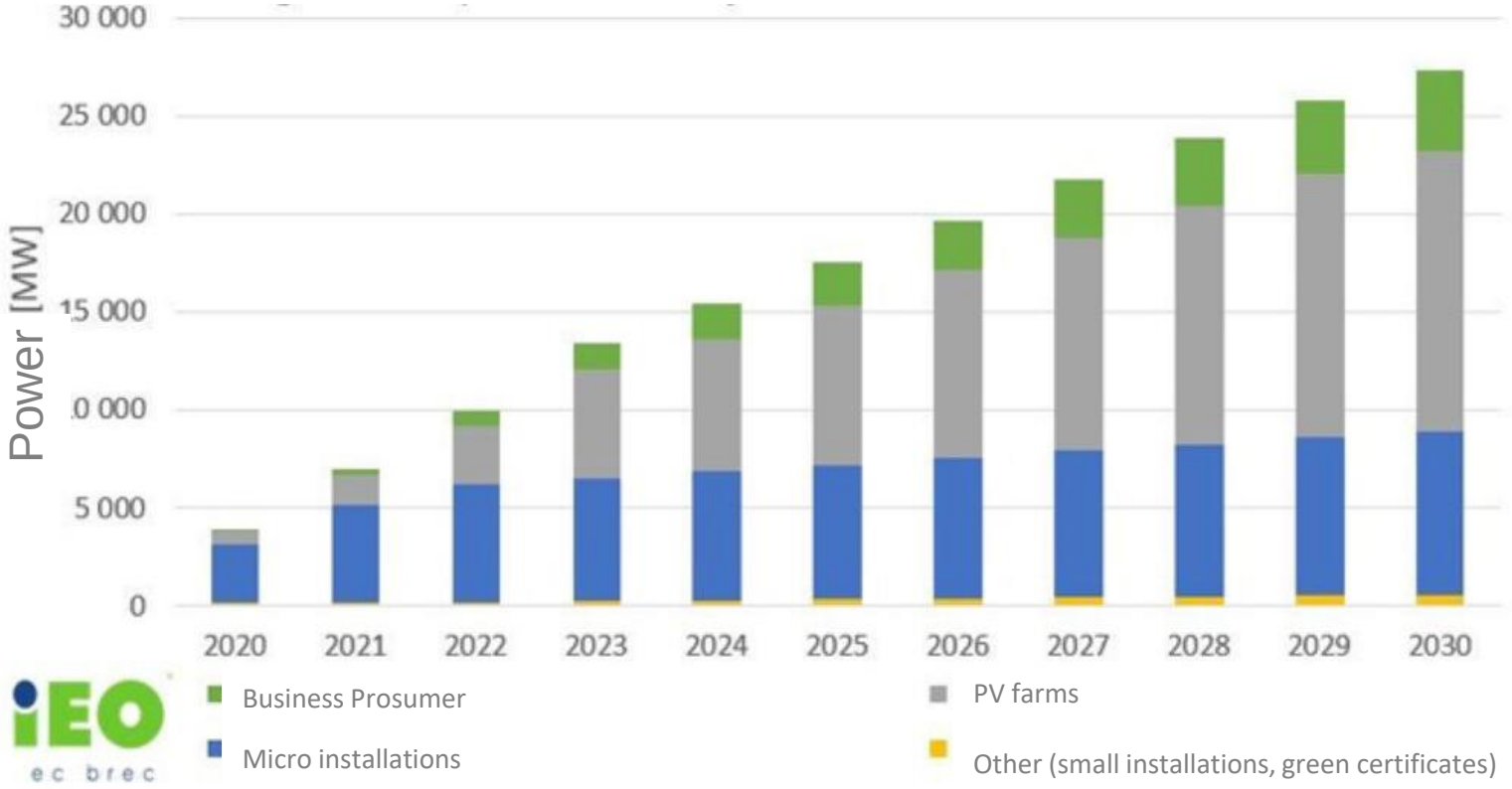
PV forecast – (in accordance with Renewable Energy Institute)

September 2021, the installed capacity in photovoltaics is 6.3 GW

(expectation for 2025 in PEP 2040: 4,95 GW!)

Expectation for 2025: 17 GW

Expectation for 2030: 27 GW



Hydrogen - forecast

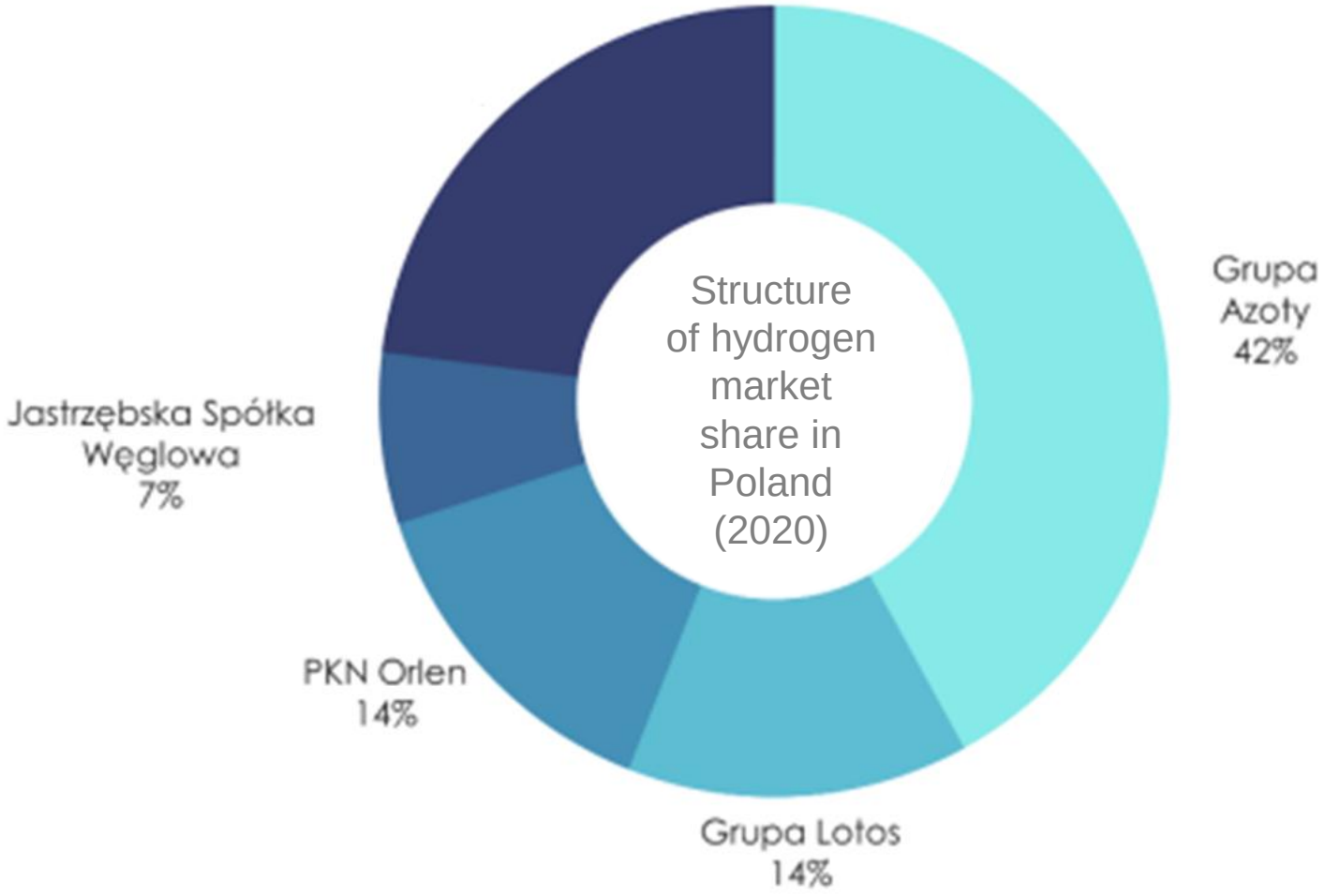
The annual production of hydrogen in Poland is approximately 1 million tonnes.

(It is mainly produced by refineries as well chemical plants and used in the refining and production of mineral fertilizers and chemicals)

Expectations for 2030 are 10 mln tonnes.

10 mln t of H2 ~ 500 GWh

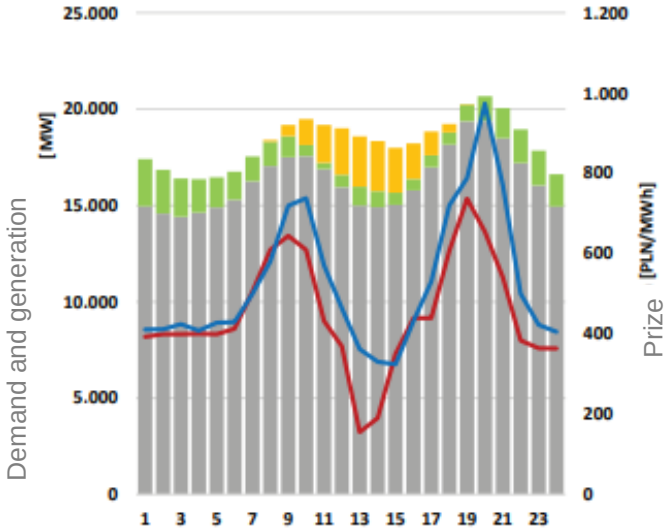
Potential of overproduction from PV sources: 10 000 GWh



Energy market situation

Generation of energy from photovoltaics reduces the price of electricity by 30-50%.

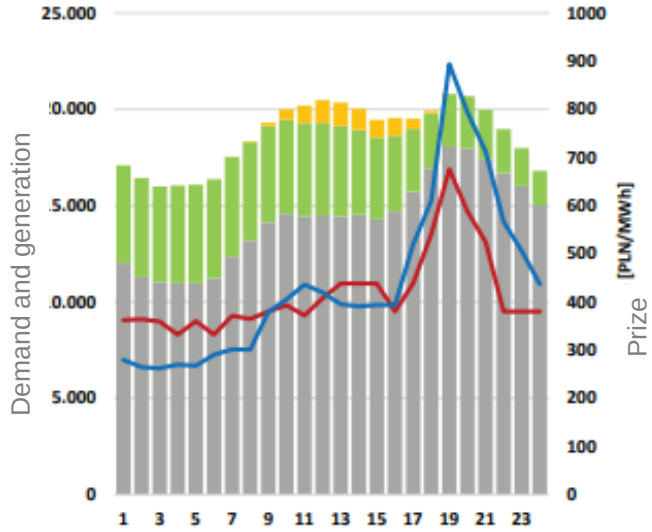
Illustration for conditions on 9 October 2021



PLN/MWh	RDN	CRO
daily average	527	450
average 10 am to 5 pm	469	373

PV
Wind
Consumption
Price (TGE)
Price (balancing Market)

Illustration for conditions on 23 October 2021



PLN/MWh	RDN	CRO
daily average	437	417
average 10 am to 5 pm	419	413

Thank you for your attention.