



# White Dragon

## Power from the sun – night & day

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# Region of Western Macedonia

Hydrogen  
for Climate Action



Western Macedonia is the only landlocked Region in Greece and the most intensive user of lignite in the country.

- ❖ Area: 9,451 km<sup>2</sup> (7.16% of the total country).
- ❖ Population: 283,689 (data 2011) inh. (2.62% of the total country).
- ❖ Unemployment rate: 27.3% (3rd Sem. 2017)
- ❖ GDP per capita (in PPS): 18,200 € (2015) 63% of the EU-28 average
- ❖ Productive structure:
  - ✓ Primary sector (6.7%),
  - ✓ Energy-mining (40.9%),
  - ✓ Processing (4.8%),
  - ✓ Construction (2.2%),
  - ✓ Services (45.5%) [2015]

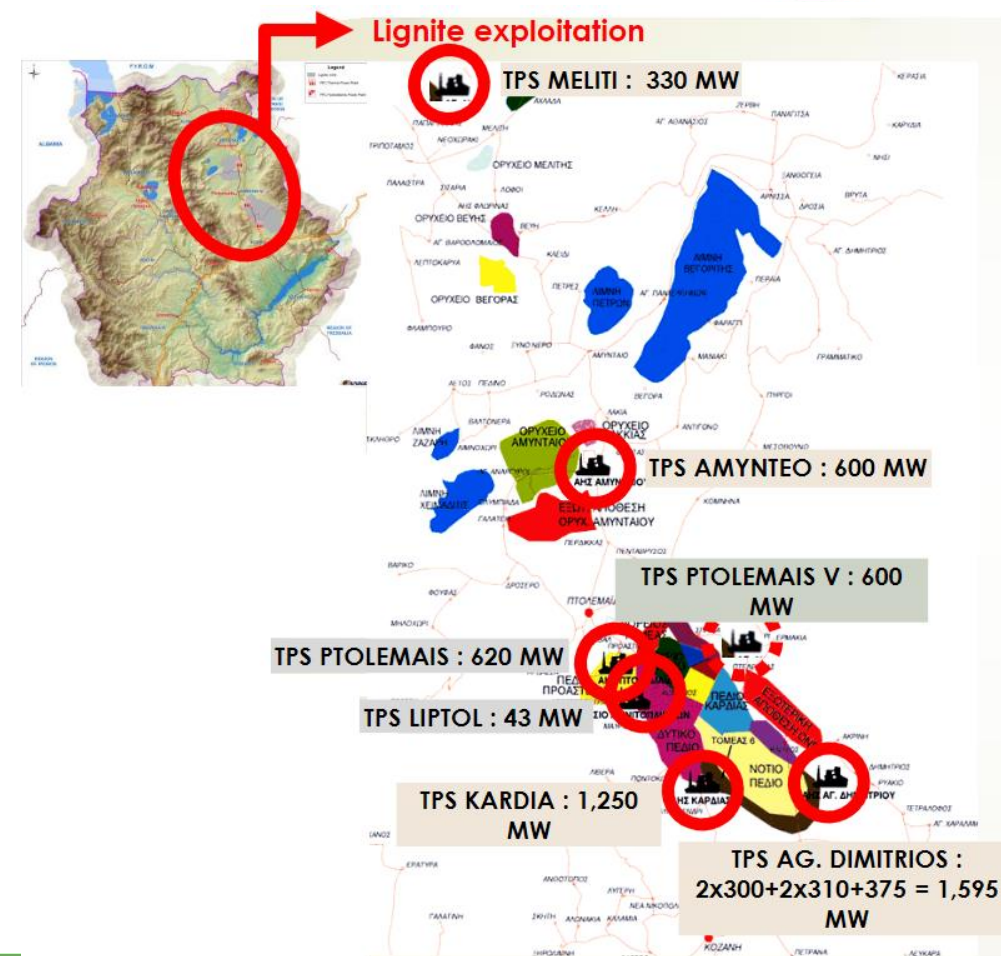


# Region of Western Macedonia



## Lignite production and utilization in the Region –main features

- Supplies electricity to Greek interconnected system since 1960, acting for several decades as the Greek energy pillar of economic growth due to the electricity low cost and utilisation of domestic energy sources
- Lignite activity includes open-cast mines of 160 thousand acres total area
- 4 lignite fired power plants of 12 units are nowadays in operation representing the 40% of thermal units and 20% of the total installed net capacity of the interconnected system in Greece.
- About 100.000 citizens of Kozani, Ptolemaida and Amynteo are heated by district heating systems from lignite power plants
- At the peak of lignite production, more than 34% of the Gross Added Value of the Region of Western Macedonia, about €1.5 billion, came from the mining and energy sector.
- 22.5 thousand of direct, indirect or inductive jobs are related to the power production industry (2009).
- For each permanent staff position in the lignite mining and power production, 2.6 positions are created and maintained in the local labor market (2013)



# Energy transition of the Region

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❑ A first phase of local lignite industry shrinkage occurred during the period 2010–2015, where 663MW of the oldest lignite-fired units ceased operation. In parallel lignite electricity production has lost its significant position in the Greek energy mix

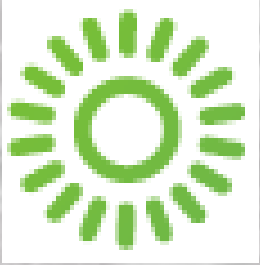
❑ A second, more severe wave of lignite sector reduction will occur in 2020, due to the 6 lignite-fired units planned operation termination dealing with 1812MW capacity, according to the existing environmental limitations

GOT  
(Governance of  
transition)

- A new sustainable production model for the Region of Western Macedonia
- A low carbon society promoting technical innovation

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# Greece, Italy, Germany, Belgium

Hydrogen  
for Climate Action



Hellenic Republic  
Region of Western Macedonia



Public Power Corporation S.A.- Hellas  
Energy for everyone



# Power from the sun – night & day

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Primary Energy:	PV – inland RES source	1.15 GW
Innovation 1:	Reversible Solid Oxide Cell	
	Electrolyser	670 MW
	Fuel Cell Power	167 MW
	District heating for 120'000 people	90 MW
Innovation 2:	Hydride storage for Hydrogen	40 GWh
	5 days autonomy, high efficiency	
Complements:	LOHC Hydrogen storage	
	PEM Electrolyser	
	Injection export by Trans-Adriatic Pipeline TAP	



# White Dragon – Lighting the midnight sun

Hydrogen  
for Climate Action



All heat provided from lignite, CO<sub>2</sub> free!

More than 20% of electricity CO<sub>2</sub> free!

More than 9'000 ton/yr hydrogen – for multiple uses

Saving more than 6 Million tons of CO<sub>2</sub> within the project

Saving 1.4 Mio ton/year CO<sub>2</sub> continuously

Creating 5'000 jobs direct jobs (today 1'400)

Triggering an investment of 2.5 Billion €



**Thank you for your attention!**

For more information on the IPCEI on hydrogen,  
please visit [www.hydrogen4climateaction.eu](http://www.hydrogen4climateaction.eu).