Innovations in the energy sector - Fossil fuels in focus

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Traditional frame: Renewables Energy Technology (RET) have an uphill battle compared to Carbon Energy Technology (CET)

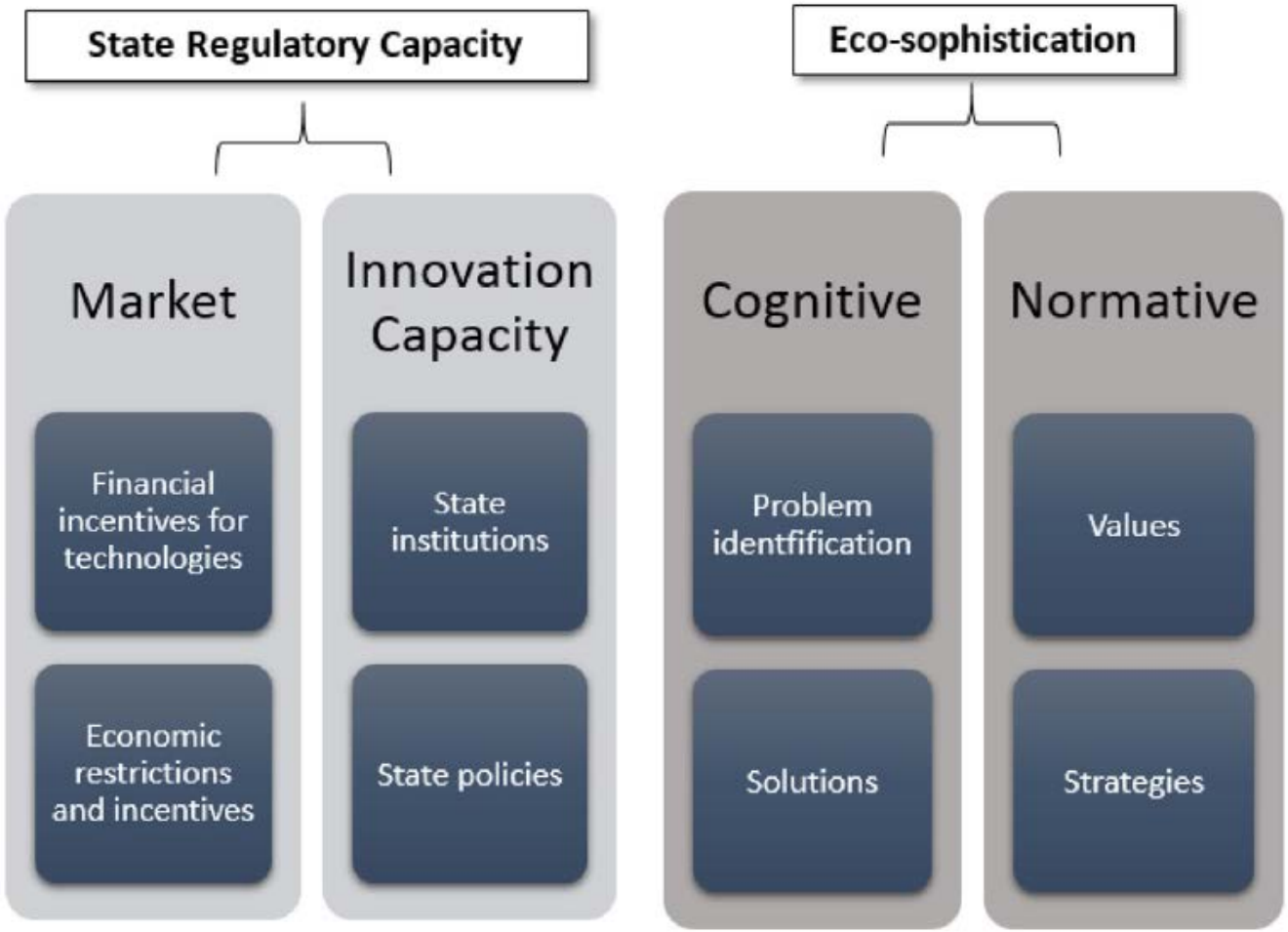
Loving Renewables

The Favored Child

Key points

1. Spaces of protection reliant on **normative and narrative** process interacting with private sector.
2. **National innovation capacity** essential for bringing new technologies to market.
3. **'Regime' and 'governance',** abstract concepts connecting with deep state processes

IMPACT OF ENERGY INNOVATION



. 1. Components of influence on the innovation of ene rgy technology in a state (formulated after Hillman

LaBelle, Michael. "A State of Fracking: Building Poland's National Innovation Capacity for Shale Gas." *Energy Research & Social Science* 23 (January 2017): 26–35.

1. THE NORMATIVE AND NARRATIVE

- RET is bad – costly and complicated
- Economic growth comes from CET & FDI
- Energy Security

Reasons for Shale Gas: The narrative

- Economic growth + jobs
- Domestic innovation and export potential (Ukraine/China)
- ENERGY SECURITY
- Make up for falling domestic conventional production
- Hedge against high ETS price on coal

Poland: Shale gas is a political priority

Limit Renewables

"We want to have renewable energy sources, but hard coal and lignite—and soon shale gas—will remain our principal energy sources....[R]enewable energy sources ... will be limited as much as EU rules will allow," former Prime Minister Donald Tusk.

Fossil Fuels drive FDI (and exports)

If the Polish government wants only Polish companies – then they can only cover 20%....

[Reason for FDI] The cost of the risks then are spread out by more companies. **And gas is a strong attractor for foreign investment** (Chief Economist, state owned oil and gas company A 2012).

The ending of Polish Shale Gas

Technology over resources

- **“Shale gas has ended not that badly when it comes to the improved techniques of unconventional gas exploration. Shale gas as such has failed indeed” Piotr Wozniak, CEO PGNiG**
- **In 2016, Polish energy policy shifted to coal gasification and liquefaction**

Slow demise

- In 2016, 84 concessions were returned.
- In 2015 four exploration wells were drilled and no hydraulic fracturing tests
- In 2012, eight tests were conducted along with four more in the two years following.

2. NATIONAL INNOVATION CAPACITY

- How innovative is Poland?
- What do ‘these’ foreign companies think of Poland?

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Poland: Innovation

Stats

- Poland is **116 of the 189** countries, for 'doing business', the World Bank.
- R&D in Poland is at the bottom of the EU, with spending at .75% of GDP, but with a goal of 1.7% by 2020.
- Less than one-third of R&D expenditures is done by the private sector

- EU structural funds directed at buying foreign technology, but not fostering domestic innovation (European Commission 2012, 174).
- 88% of electricity produced in Poland is from hard coal and lignite.

Working with investors

"We have five minutes to check with global players and potential players, and we simply cannot afford to lose time. If we can't achieve this in five minutes they will go somewhere else" (Country manager for oil and gas services firm 2012).

Foreign Company Strategies

1. Exit from Poland - Marathon Oil, Talisman Energy and Exxon Mobil
2. Push ahead – smaller independent companies
3. Joint ventures – state owned oil and gas companies, like Lotus and PGNiG partner with foreign energy firms

Polish Problems:

- 3 administrative staff processing applications
- 120 days for approval, not prescribed 30 days
- Vague and non-uniform application process
- Uncertain tax regime
- 5 ministries (with competing interests) in shale gas

3. GOVERNANCE AND NATIONAL INNOVATION CAPACITY

- Innovation Wasteland or Nirvana?
- Prompting and fueling innovation through push-pull policies
- National Innovation Environment

Innovation and governance in Poland

Innovation Wasteland

Innovation Nirvana

Eco-Sophistication and Importing Innovation: Nirvana or Wasteland?

Clusters and Countries	Eco-Sophistication	Commercialization strategy
Cluster 1 countries: UK, US, Norway, France, Austria	Low RET demand growth (0 - 2%); high Eco-Sophistication	Venture capital, equity financing, acquisition
Cluster 2 countries: Germany, Spain, Denmark, Ireland	High RET demand growth (2.8 – 7.8%); high Eco-Sophistication	(mixed) Outsourcing, licensing; Venture capital, equity financing, acquisition
Cluster 3 countries: Poland, Hungary, Greece, Brazil	Low – moderate RET demand growth (1% - 3.8%); moderate Eco-Sophistication	Outsourcing, licensing
Cluster 4 countries: Russia, China, India, Turkey	Low RET demand growth (0% - 1.8%); low Eco-Sophistication score	Government incentives, external R&D contracts, utility funding
Source: Walsh 2012		

Push-Pull policies

Technology-Push Policies	Technology-Pull Policies
Government demonstration grants	Feed-in tariff
Public R&D	Reduction of fossil fuel subsidies
Grants for SMEs	Technology performance standards
Investment subsidies	Residential and commercial tax credits
Private R&D	Renewable fuel standards
Tax breaks for entrepreneurs	CO2 trading
Tax Breaks for investors	Public procurement
Incubators	Production tax credit
Government Investment in Private VC	CO2 Tax
Soft Support Measures	Renewable portfolio standards
Government VC	Renewable certificate trading

Source: (Burer and Wustenhagen 2009, 5001–5002)

CONCLUSION

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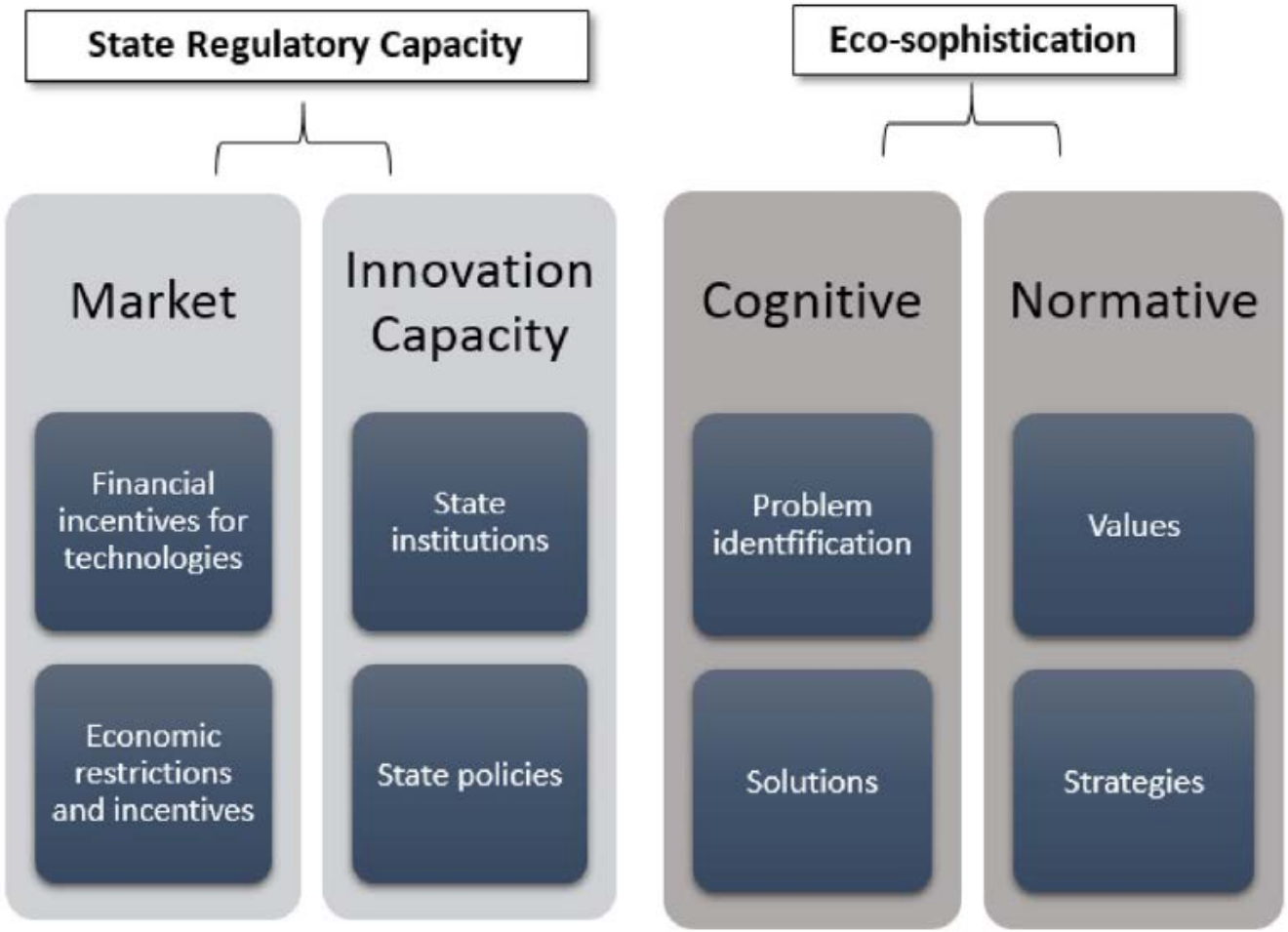

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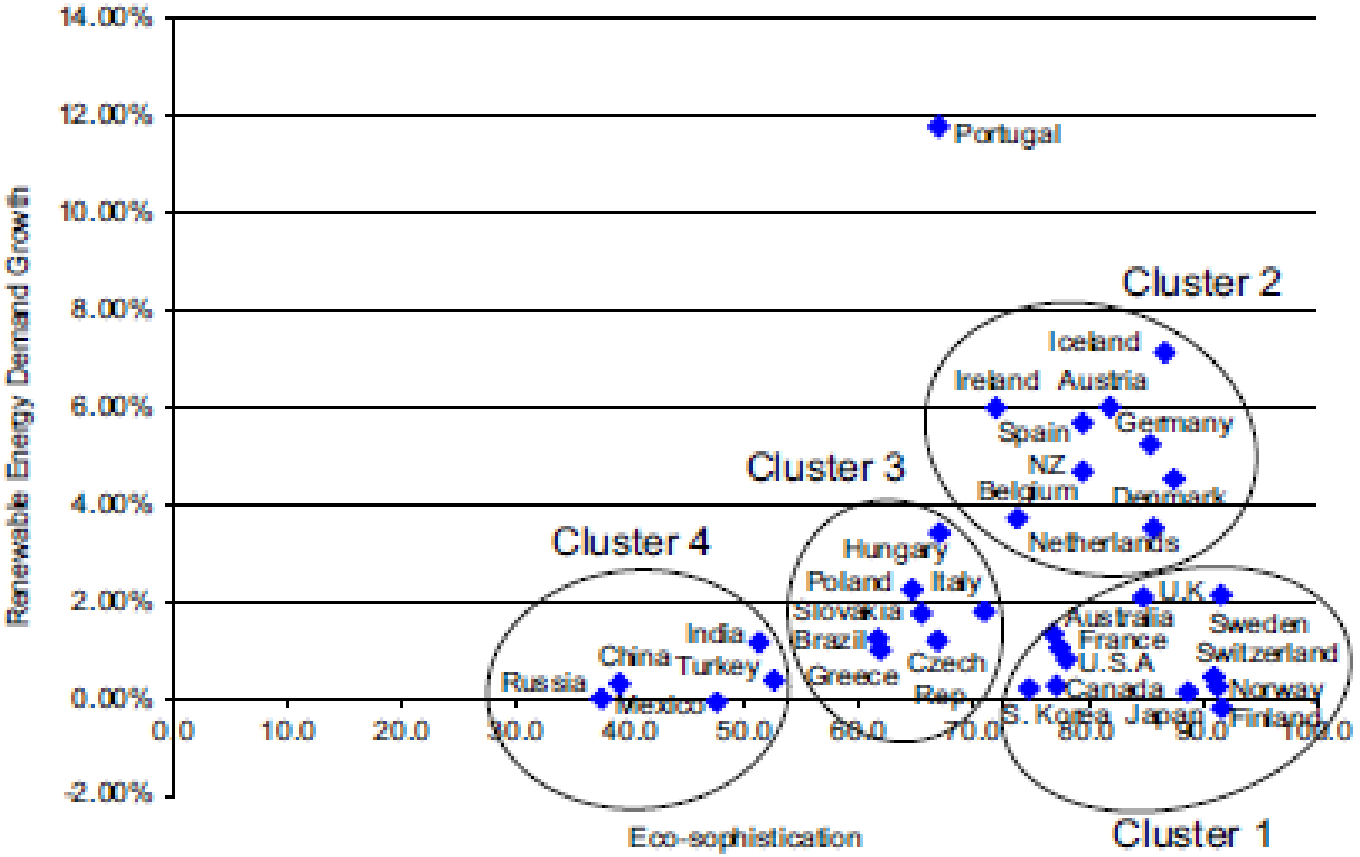

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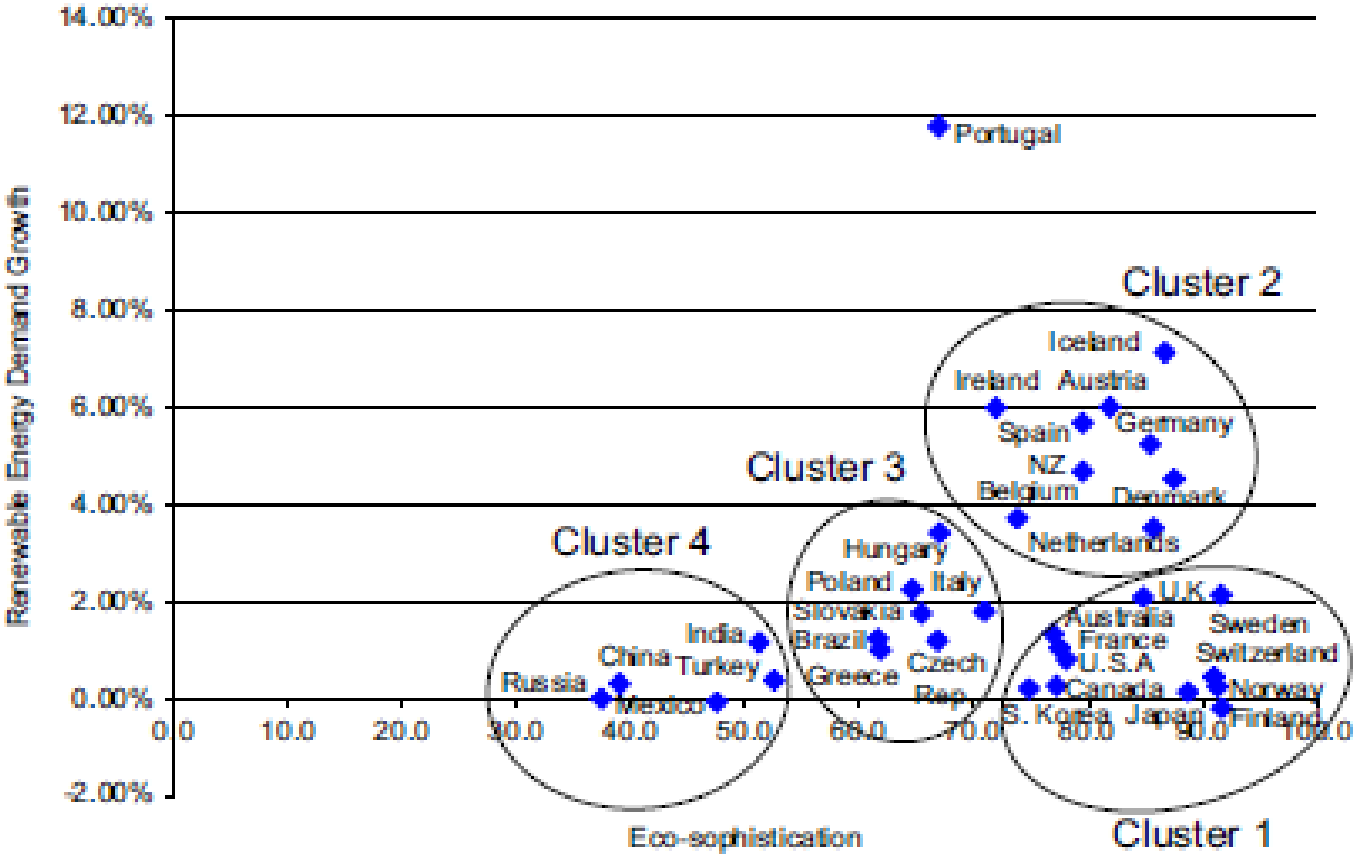

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