

# The Energy Trilemma

8th Smart Grids Cleanpower 2017 Conference  
Cambridge, UK 19-20 June

[www.cir-strategy.com/events](http://www.cir-strategy.com/events)

...join the follow up 9th SGCP18 26-27 June Cambridge, UK

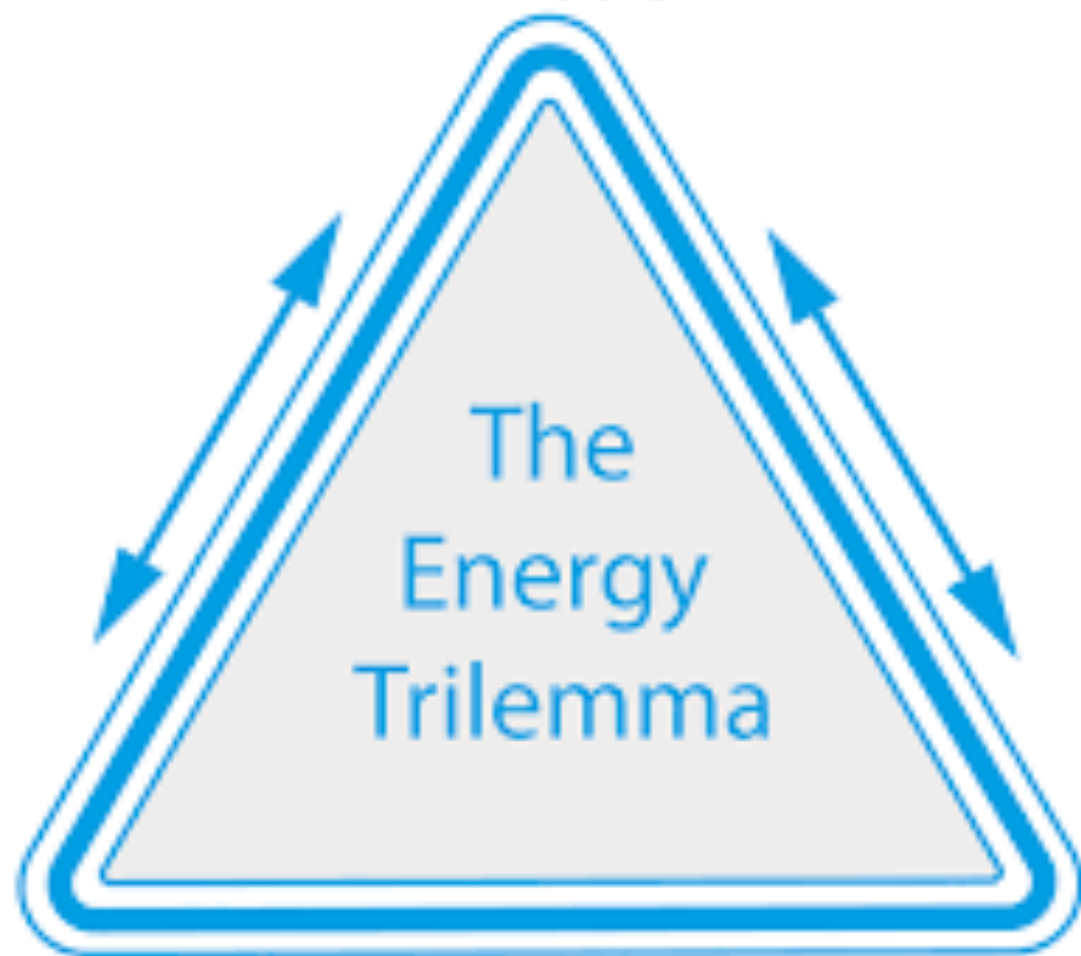
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Security  
of supply

The  
Energy  
Trilemma

Affordability

Sustainability





**Energy Security**

ENERGY SUPPLY, RELIABILITY OF ENERGY INFRASTRUCTURE, AND ABILITY TO MEET CURRENT AND FUTURE DEMAND



ACCESSIBILITY AND AFFORDABILITY OF ENERGY SUPPLY ACROSS THE POPULATION

**Energy Equity**



SUPPLY AND DEMAND-SIDE ENERGY EFFICIENCIES AND DEVELOPMENT OF RENEWABLE AND LOW-CARBON ENERGY

**Environmental Sustainability**



# Energy Trilemma Index

- Developed by the World Energy Council and Consultants Oliver Wyman
- Ranks countries on their ability to provide sustainable energy through 3 dimensions: Energy security, Energy equity (accessibility and affordability), Environmental sustainability
- The ranking measures overall performance in achieving a sustainable mix of policies and the balance score highlights how well a country manages the trade-offs of the Trilemma with "A" being the best

Index rank	Country	Balance score	Energy security	Energy equity	Enviromental sustainability
1	<a href="#">Denmark</a>	AAA	1	10	6
2	<a href="#">Switzerland</a>	AAA	12	2	3
3	<a href="#">Sweden</a>	AAA	10	27	8
4	<a href="#">Netherlands</a>	AAB	9	3	42
5	<a href="#">Germany</a>	AAA	7	15	31
6	<a href="#">France</a>	AAA	16	9	11
7	<a href="#">Norway</a>	AAA	29	29	4
8	<a href="#">Finland</a>	AAB	3	24	71
9	<a href="#">New Zealand</a>	AAB	13	20	36
10	<a href="#">Austria</a>	AAA	20	6	23
11	<a href="#">United Kingdom</a>	AAA	32	8	15
12	<a href="#">Slovenia</a>	AAB	2	25	44

# What metrics are used?

- [https://trilemma.worldenergy.org/#!/  
pathway-calculator](https://trilemma.worldenergy.org/#!/pathway-calculator)

# How does the Smart Grid Address the Energy Trilemma?

- Energy Security -
  - Enhanced grid resilience and reliability;
  - Integration and management of distributed generation and increased energy independence through domestic renewable energy sources;
  - A decentralised grid structure

# How does the Smart Grid Address the Energy Trilemma?

- Environmental Sustainability

- Reduce emissions

- Through feedback on energy usage,

- Lower line losses,

- Accelerated deployment of energy efficiency programmes,

- Continuous commissioning of service sector load, and

- Energy savings due to peak load management



# How does the Smart Grid Address the Energy Trilemma?

- Affordability
  - Through increased efficiency,
  - Expand the useful life of existing energy infrastructure, avoiding immediate large-scale investment in upgrading transmission and distribution
  - Peak shifting is an important cost saving
  - By providing customers with detailed information about pricing and loads, the smart grid is expected to achieve significant peak shifting through demand response

# Energy Catalyst – Round 5

- £13m for innovative projects
- Co-funders – DFID, BEIS and EPSRC
- Run by Innovate UK
- Proposals must address all 3 elements of the energy trilemma

Thankyou

Any Questions?

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