



Совершенство
бизнес,
улучшаем мир

Energy consulting as an instrument for shaping energy mix

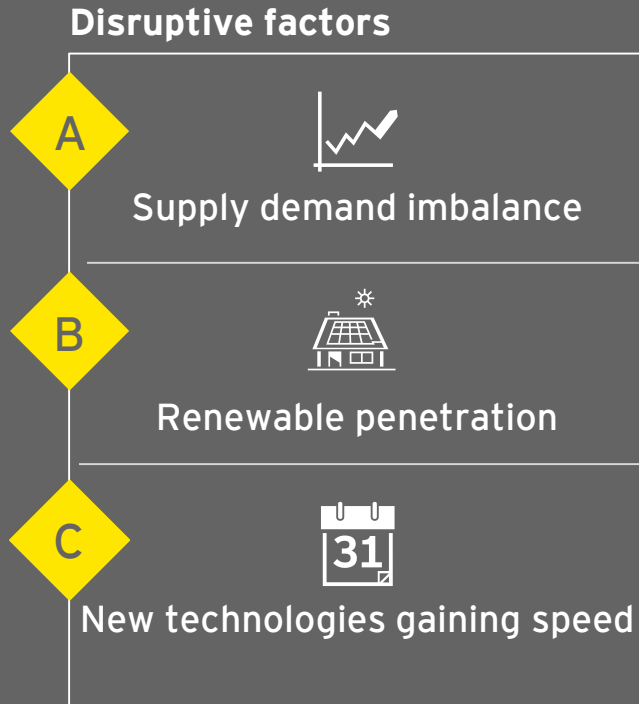
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Anton Poriadine, Partner, CIS Strategy Leader

Key messages to remember

- 1 A series of ***disruptive factors*** is driving transformation in the energy sector creating whole new energy systems
- 2 ***The pace of change will be defined by three “tipping points”*** reflecting the advancement of nonutility renewables, battery storage and EVs
- 3 More customers demand not just a cheap energy but a ***comprehensive energy solution***, which fits well into connected future energy landscape
- 4 To succeed in the new paradigm vendors should ***shift away from selling products to providing energy system solutions***. Leading OEMs as well as the ***players from adjacent industries*** are moving full speed to the ***service based business model*** as well
- 5 ***Energy consulting*** is the industry new competitive response to the demands of the future, which requires ***building critical competencies*** and ***mastering partnerships*** with players from the other industries

A series of disruptive factors is driving transformation in the energy sector



Delivery technologies



Solar PV



Battery storage



Electric vehicles



Microgrids



Home and building energy systems

Enabling technologies



Smart meters



Artificial intelligence



Grid edge technologies



Cloud



Peer-2-peer energy exchange

The future of power & utilities is emerging rapidly and will materialize through three “tipping points”

Tipping point 1

“Grid cost parity” of non-utility* solar plus storage systems

The birth of the new energy system



Tipping point 2

The price of battery electric vehicles reaches cost parity and performance parity with ICE** vehicles

Electricity and mobility industry convergence



Tipping point 3

The cost of transporting electricity exceeds the cost of generating and storing it locally

The digital energy market place

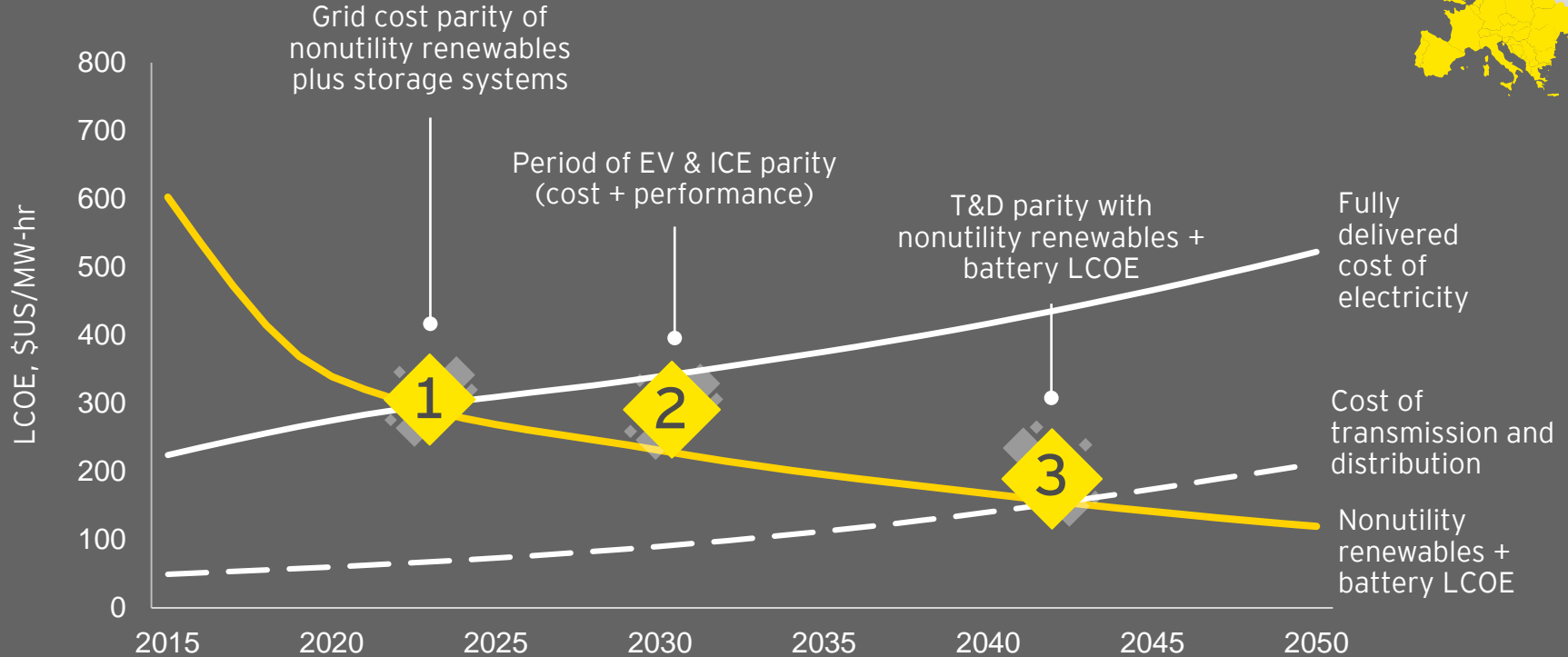


* Non-utility: households and business customers producing electricity

**ICE: internal combustion engine

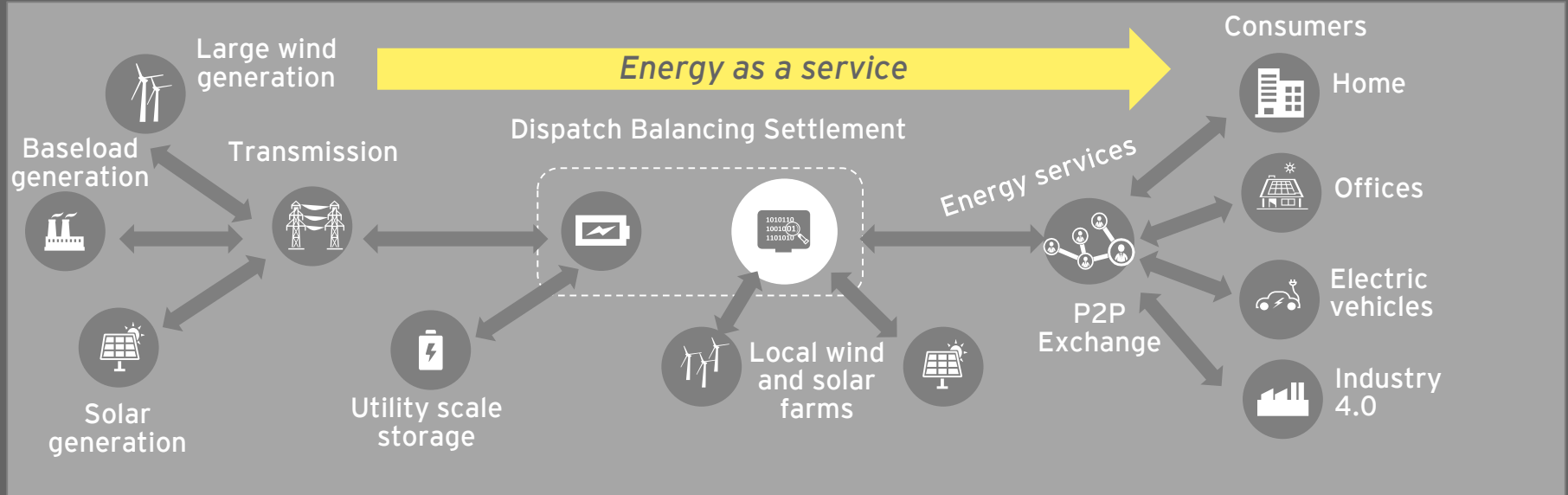
The pace of change will be defined by the advancement of nonutility renewables, battery storage and EVs

Countdown Clock Concept (Europe example)



More customers demand not just cheap energy but an energy solution, which fits into an uncertain future energy landscape

Future energy landscape



Energy consulting - defining the solution

What products will fit the new system and how to put it all together?

How will the optimal energy system look like?

What will the future consumers demand?

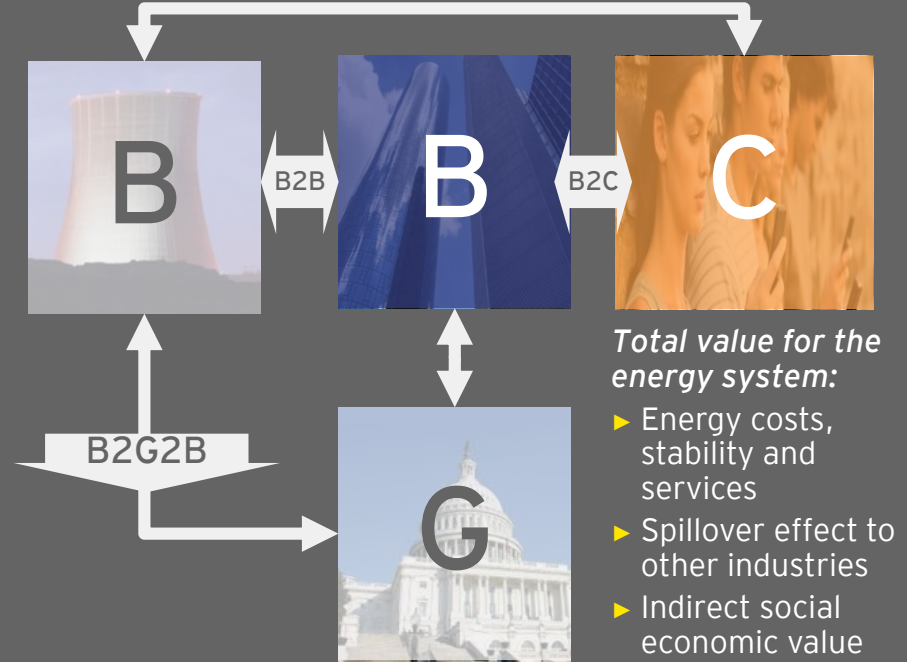
To succeed in the new paradigm vendors cannot afford just selling products but are expected to provide value focused solutions

Rethinking the value flow matrix
From Un-connected World...



Traditional mindset - In our business we sell...

...To Connected World¹



Modern mindset - We help our clients succeed

1) Source: Victor Cho, March 2012, Global connectivity and the new business world of connected value flows, EY analysis

Leading OEMs¹⁾ but also players from adjacent industries are moving full speed to offering system solutions

Case example from Water Utilities

Traditional business model

- ▶ Business: Water and energy supply, waste management
- ▶ Products: Operator of water and energy facilities
- ▶ Geography: Already a multinational player



New evolving business model (since 2000s)

- ▶ Business: Multi-utility integrated system solution provider. Alliances with digital system providers for smart monitoring and operations
- ▶ Products:
 - ▶ For B2G - EPCM based water supply solutions (incl. equipment), water system management, **consulting on complex matters**
 - ▶ For B2B - new multi-utility businesses
 - ▶ For B2C - online customer interaction
- ▶ Geography: 48 countries



Energy consulting is the integrating element in the long term energy solution

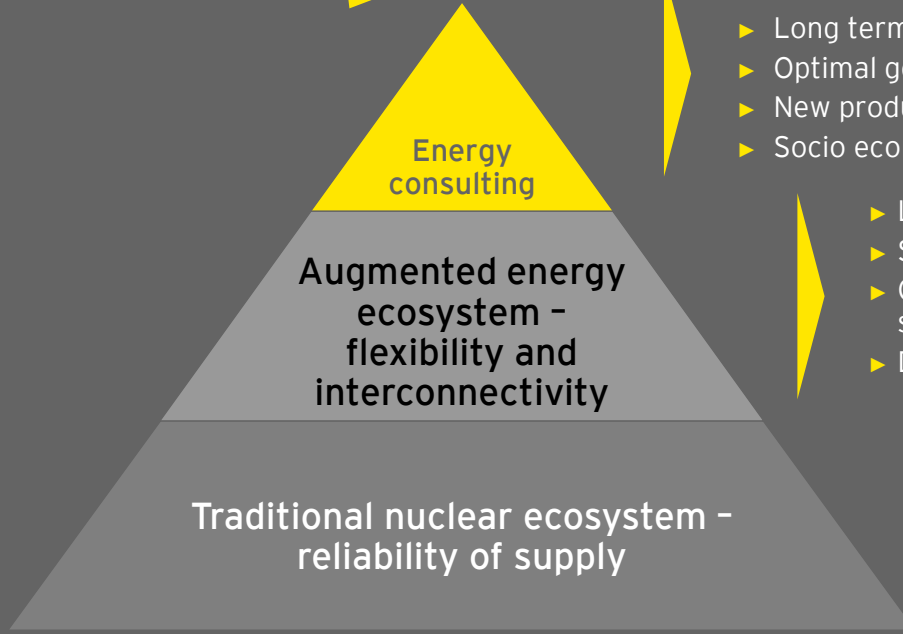
Energy consulting value proposition

Customer proximity

Technology proximity



Long term energy solution



Energy consulting

Augmented energy ecosystem - flexibility and interconnectivity

Traditional nuclear ecosystem - reliability of supply

▶ A service that integrates:

- ▶ Long term scenarios
- ▶ Optimal generation mix
- ▶ New products and business models
- ▶ Socio economic impact

- ▶ Large scale and local renewables
- ▶ Storage
- ▶ Grid infrastructure and energy services
- ▶ Desalination facilities

- ▶ Large NPPs
- ▶ Small and medium NPPs (e.g. 600MW), floating,...
- ▶ Nuclear fuel and services
- ▶ Decommissioning and reprocessing

The clients will be able to translate the future vision of the energy system into demand for energy products and delivery business model

Energy consulting offering

