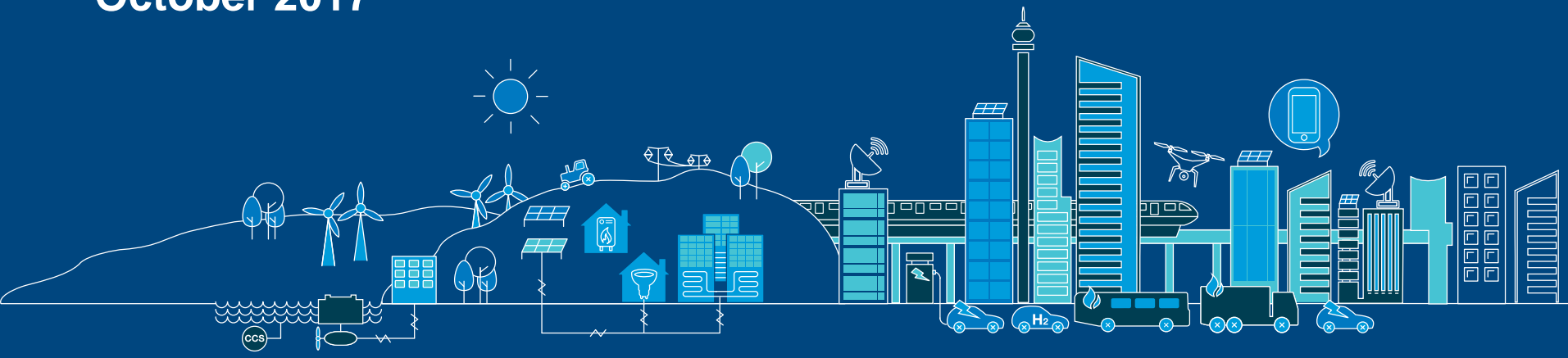


Future Energy Scenarios Stakeholder workshop

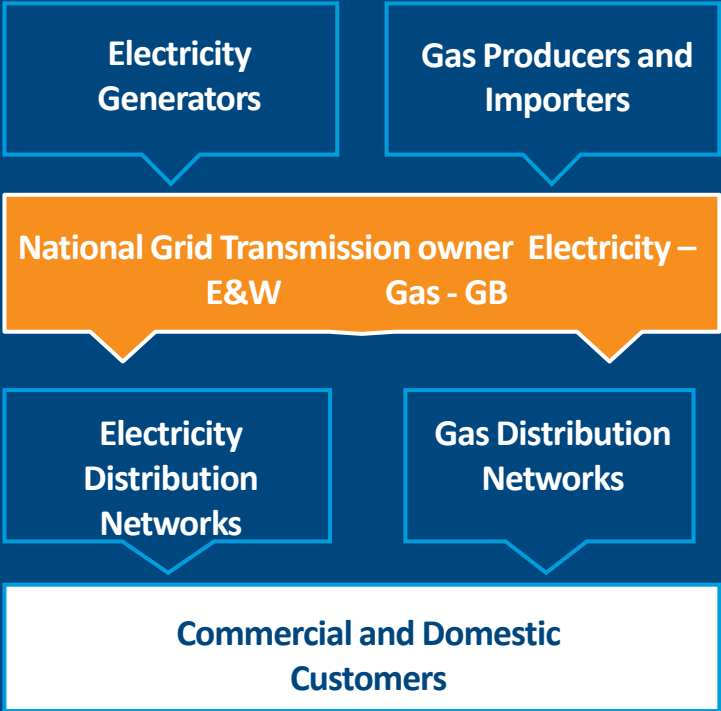
nationalgrid

FES Overview

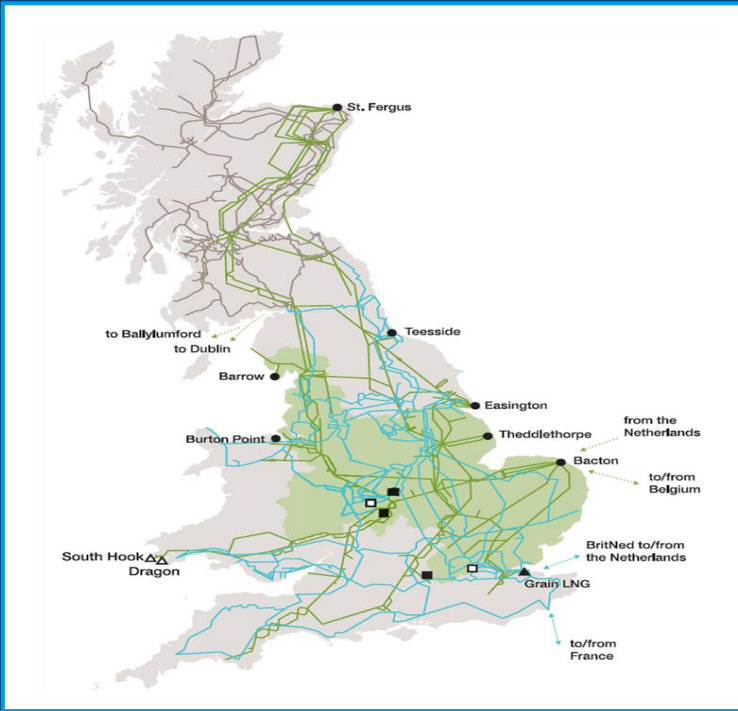
October 2017



Briefly about National Grid...



System Operator





What are the Future Energy Scenarios and how are they used?

- **Credible energy pathways to 2050**
- **Consider energy demand and supply on a whole system basis**
- **Unconstrained**



What are the Future Energy Scenarios and how are they used?





Developing FES with stakeholders



Our stakeholder engagement this year involved:

- Over 390 organisations engaged
- Webinars on a range of subjects
- Workshops across four locations
- Continuing the conversation through thought pieces and newsletters

FES 2017 – Key messages

1 An energy system with high levels of distributed and renewable generation has become a reality. This growth is set to continue, increasing the complexity of operating a secure and cost effective energy system.



2 New technologies and evolving business models are rapidly transforming the energy sector. Market and regulatory arrangements need to adapt swiftly to support a flexible energy system with an increasing number of participants.



3 Electricity demand has the potential to increase significantly and the shape of demand will also change. This is driven initially by electric vehicles and later on by heat demand. It will require a range of solutions to deliver best value for consumers, including a coordinated approach across the whole system; investment in smart technologies, transmission and distribution infrastructure; and commercial approaches such as consumer behaviour change.

4 Gas is critical to security of supply now and as Britain continues the transition to a low-carbon future. It will have a long-term role as a flexible, reliable and cost-effective energy source favoured by many consumers.



COMPLEX

ADAPT

CONSUMER

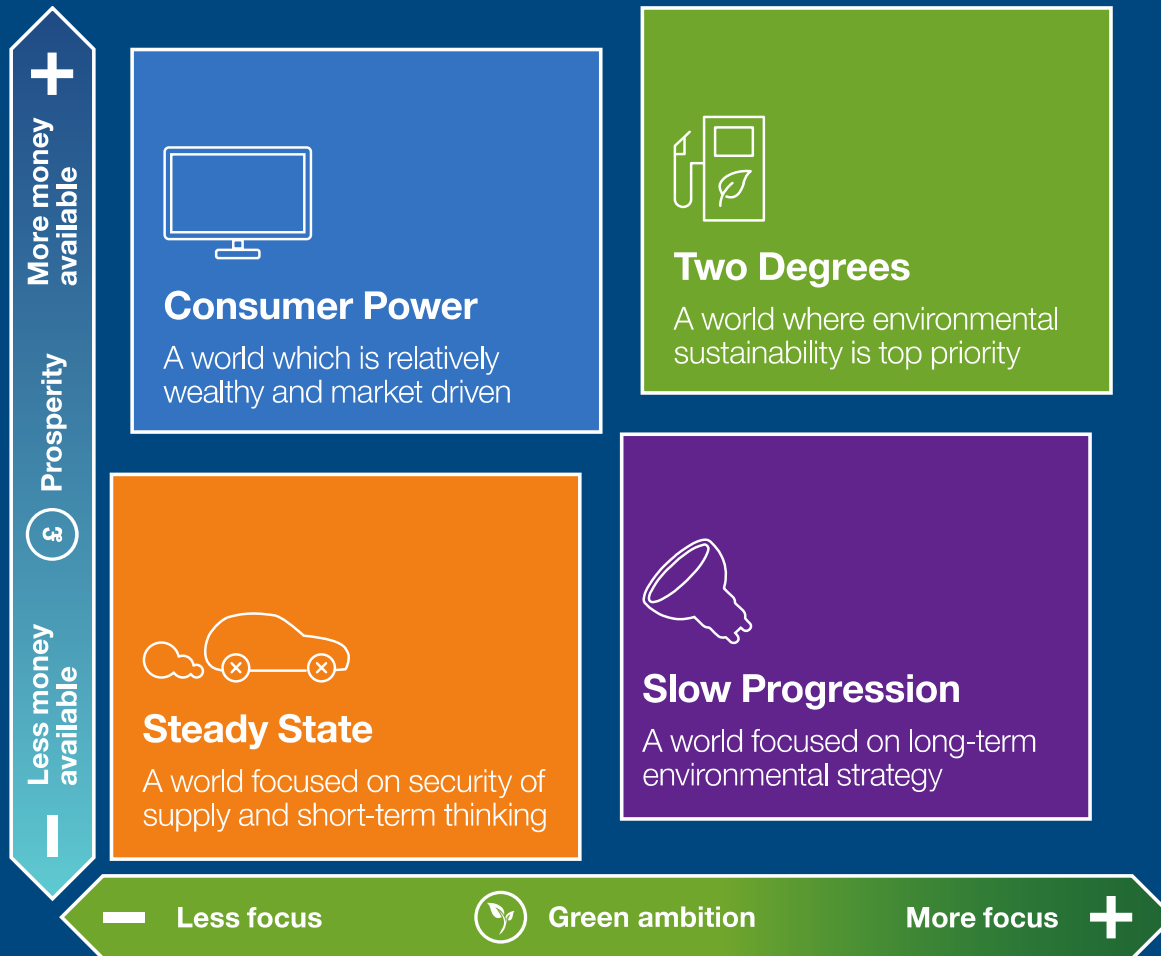
GAS

Our 2017 scenario matrix

nationalgrid



@NationalGridUK
#FES2017





2017 sensitivities



High
Electrification



Decarbonised
Gas

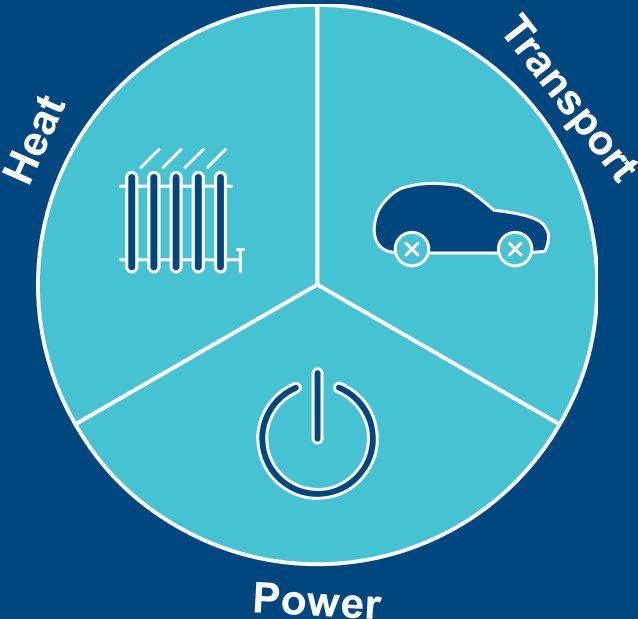


Consumer
Renewables

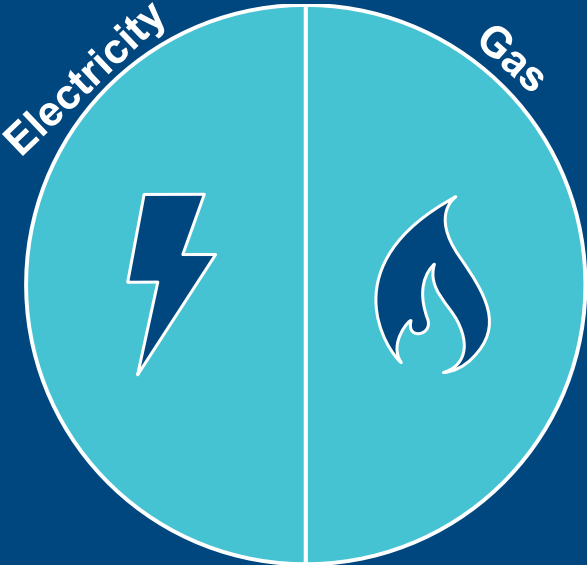


High EV

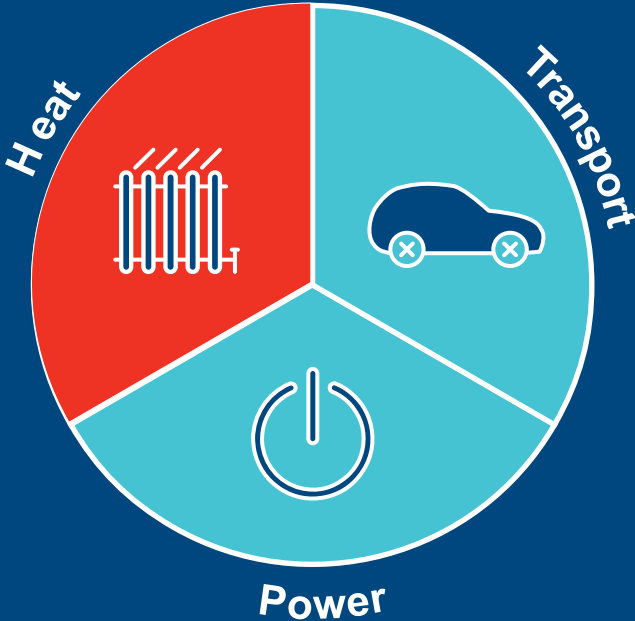
Demand

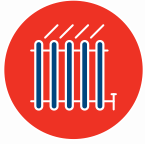


Supply



Demand





Heat

Residential Heating



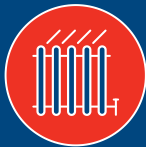
80%



13%



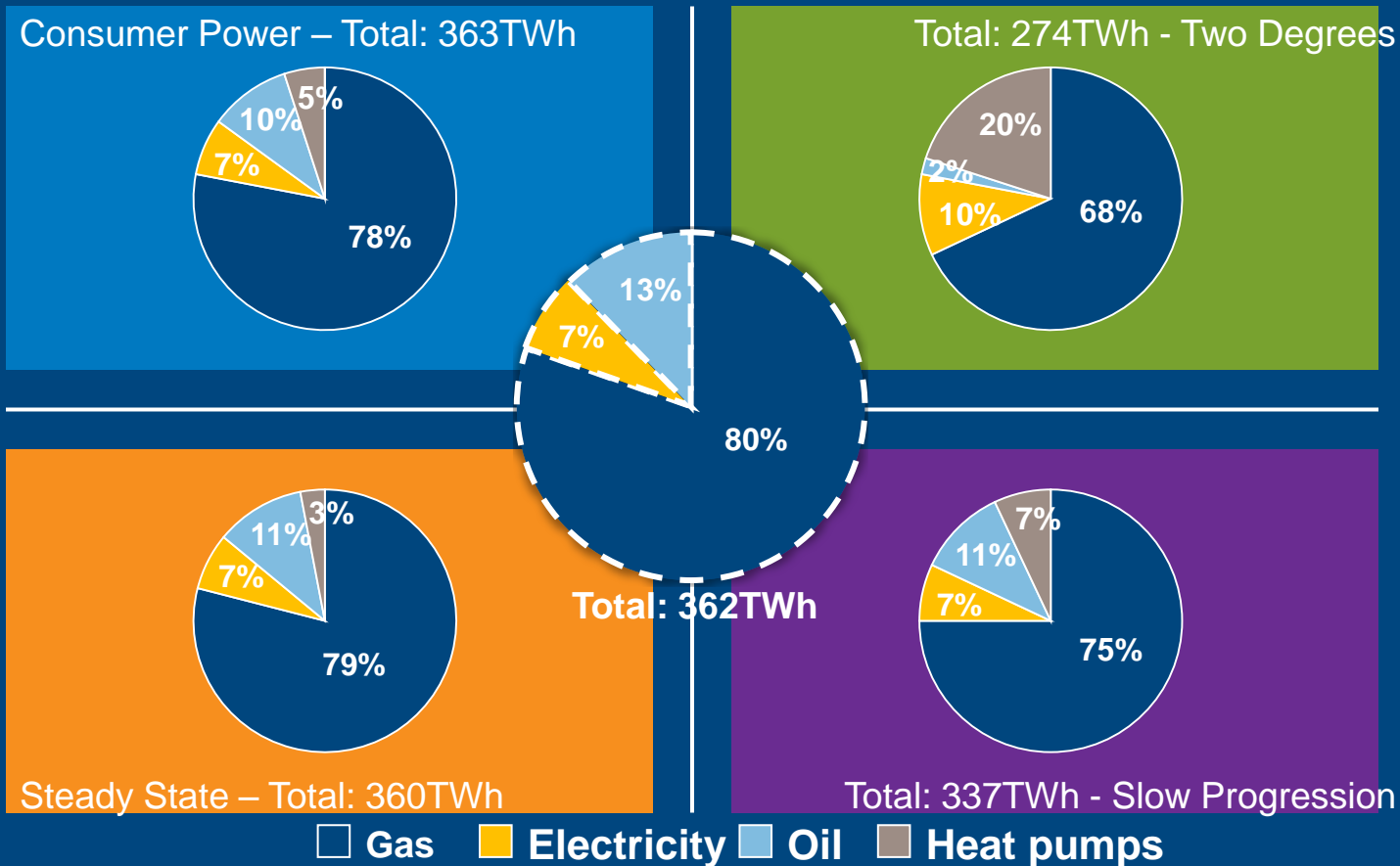
7%



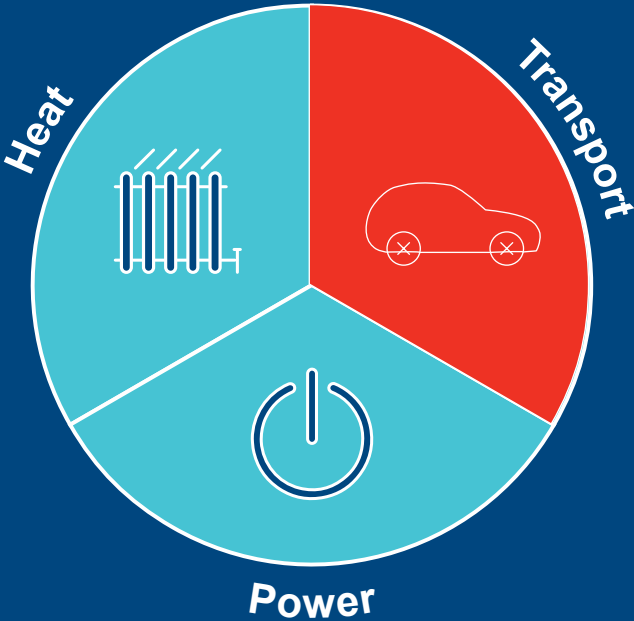
Heat

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Residential demand - 2030



Demand



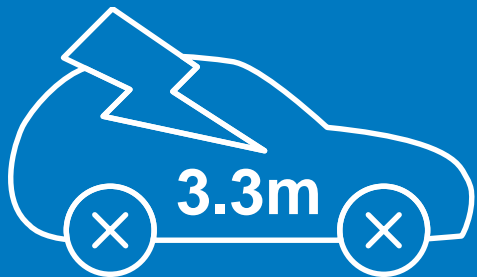


Transport

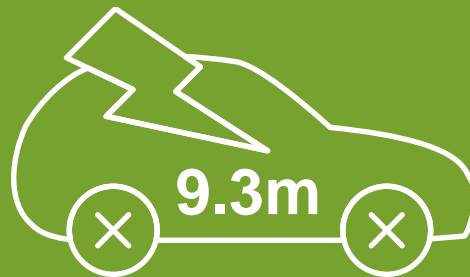
nationalgrid

Number of EVs - 2030

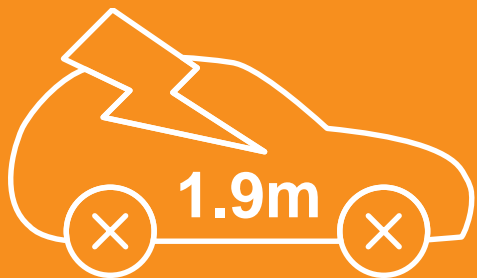
Consumer Power



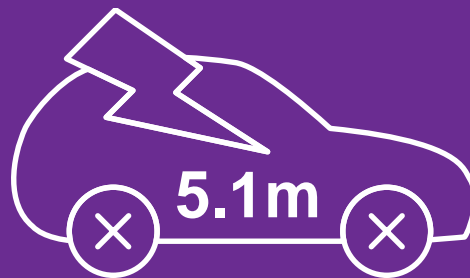
Two Degrees



100K



Steady State



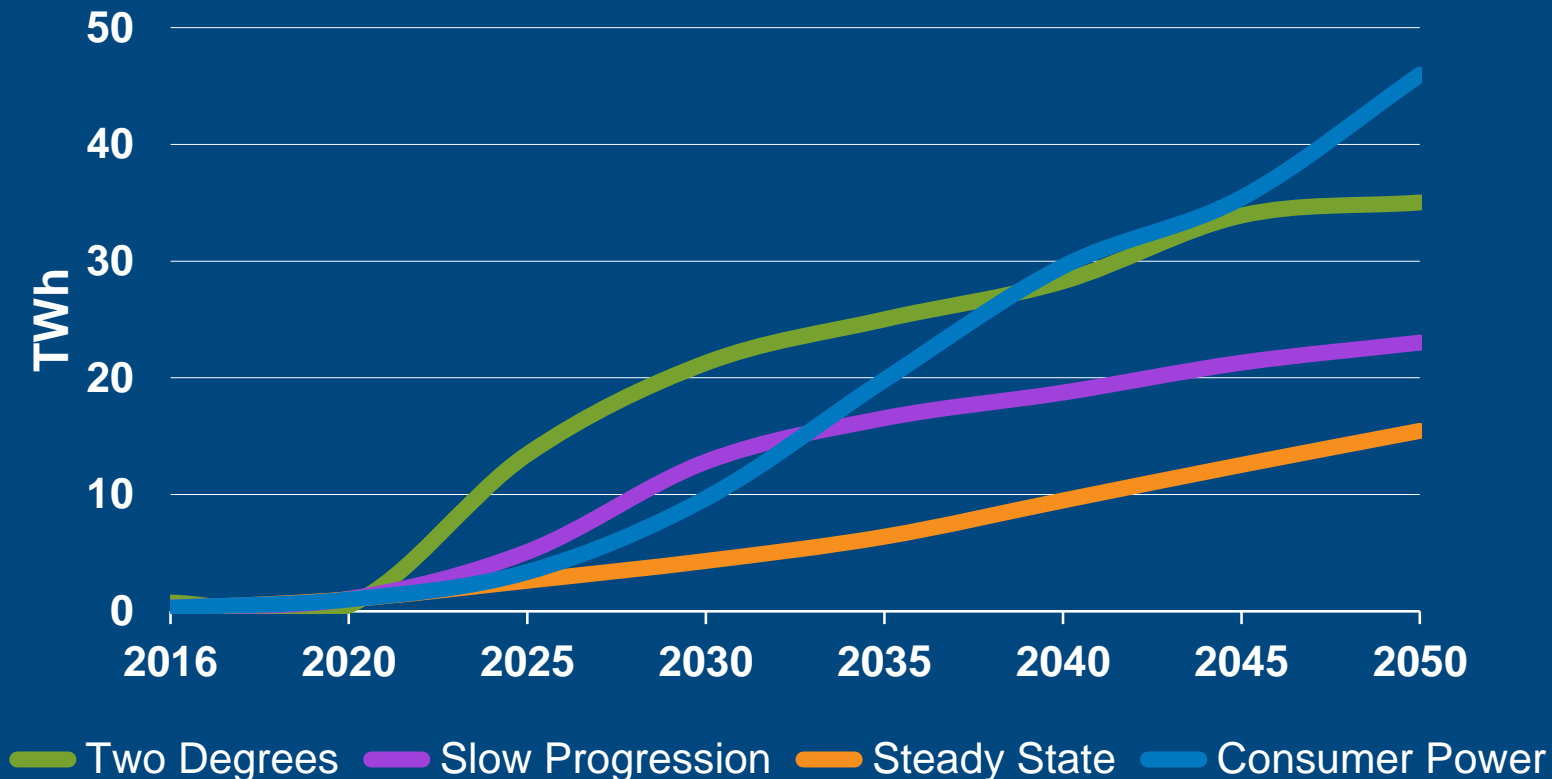
Slow Progression



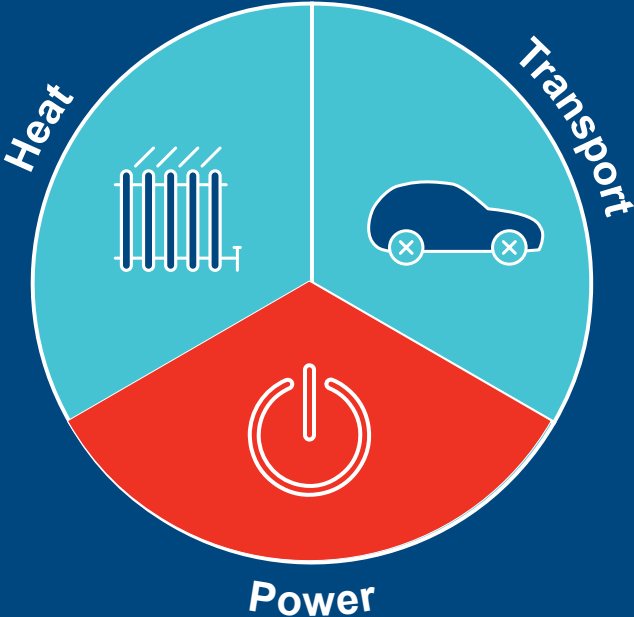
Transport

nationalgrid

Total electricity demand for EVs



Demand





Power

nationalgrid



60W



10W



5W



Power

TV Pickups above 500MW



2006

523

2016

63



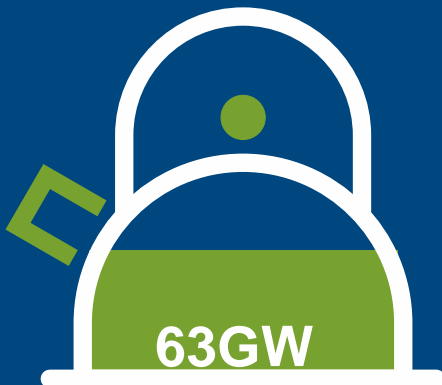
Power

Effects of Smart technology and Consumer Choice

nationalgrid



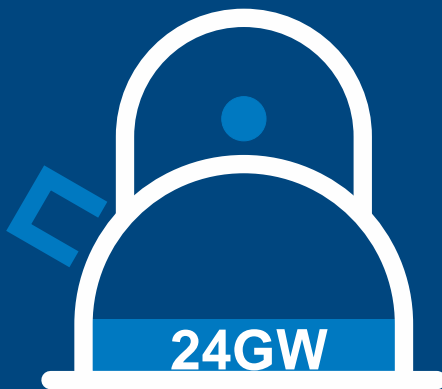
2017



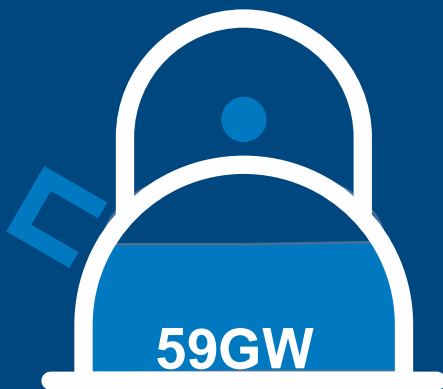
Unconstrained 2050



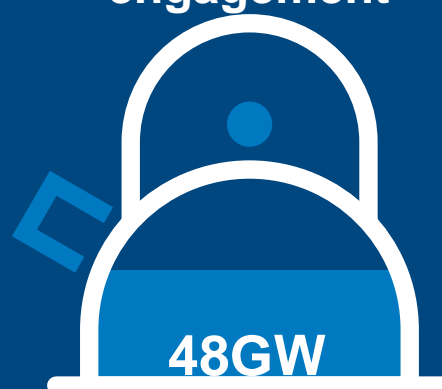
With consumer engagement



24GW



59GW



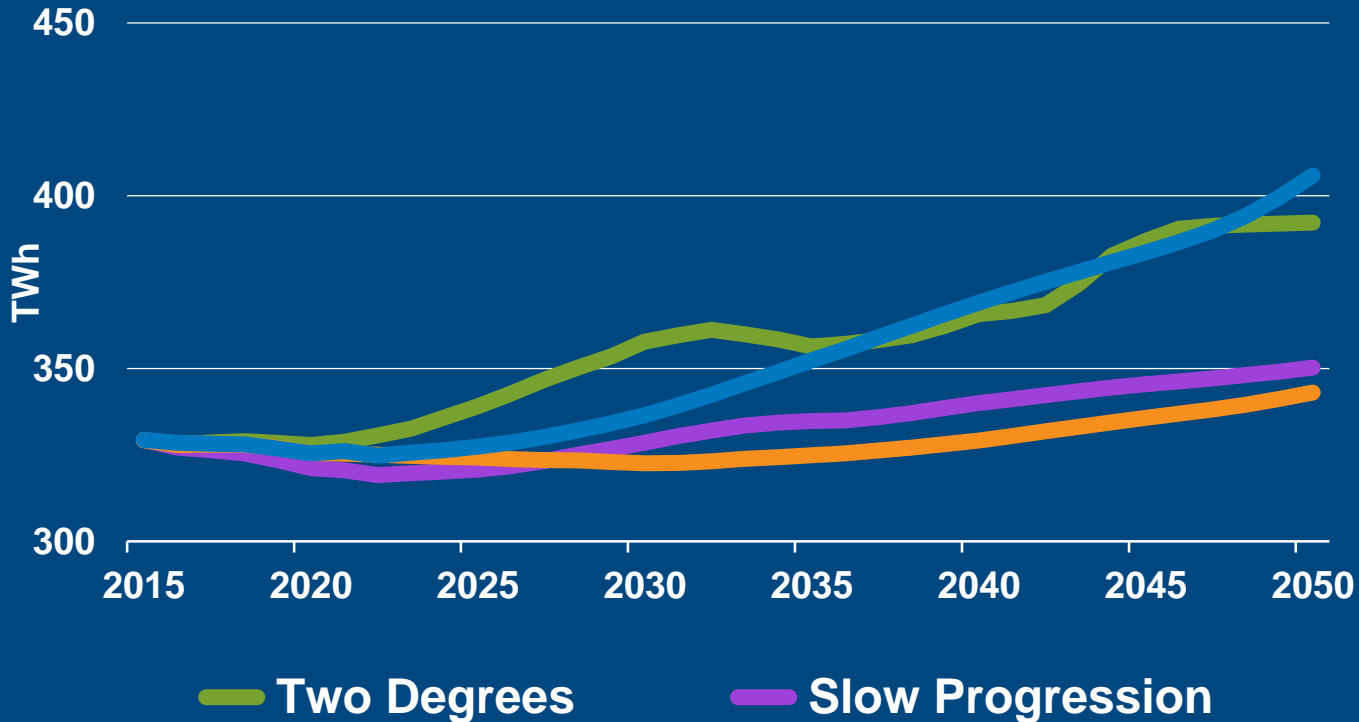
48GW



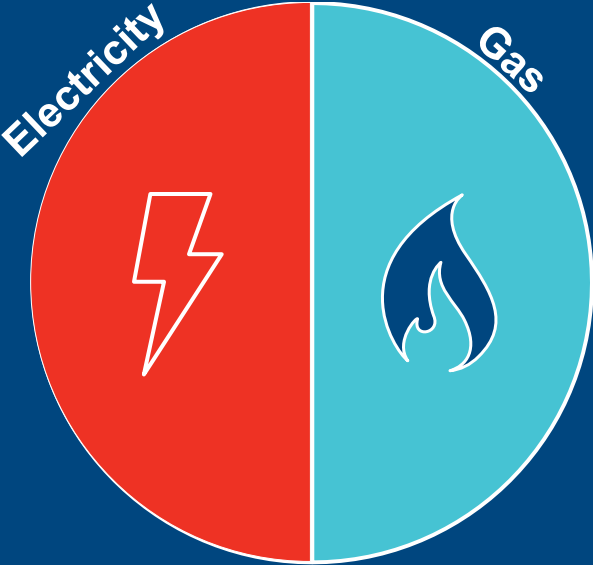
Electricity

nationalgrid

Total Annual Electricity Demand



Supply





52%

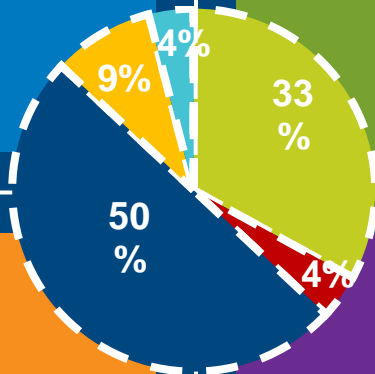
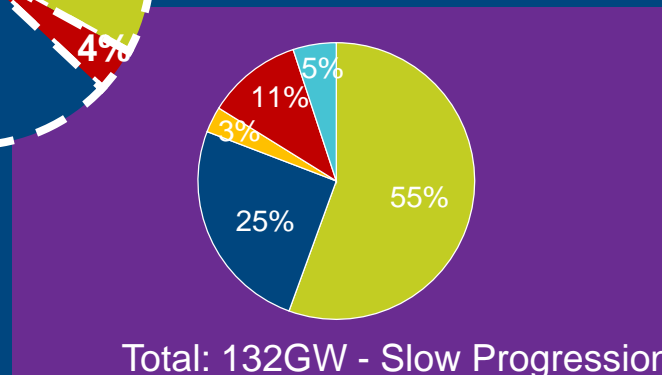
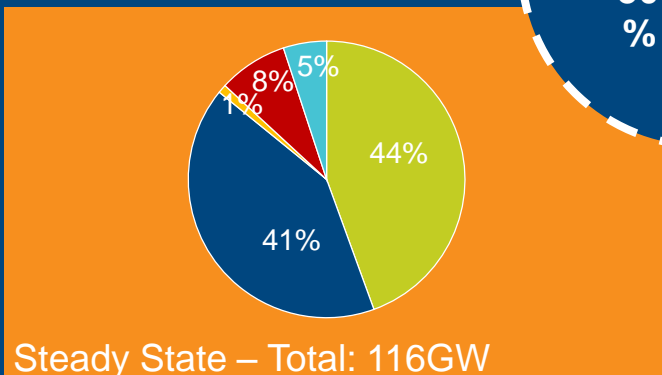
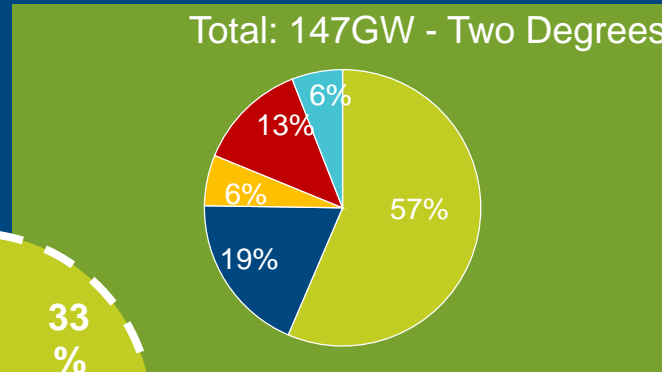
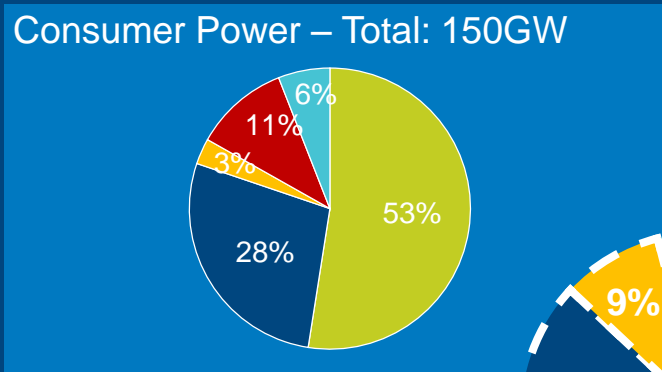
Greenest summer ever



Electricity

nationalgrid

Installed capacities type - 2030



Thermal Renewables Nuclear Interconnectors Storage

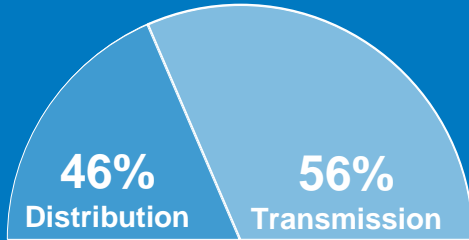


Electricity

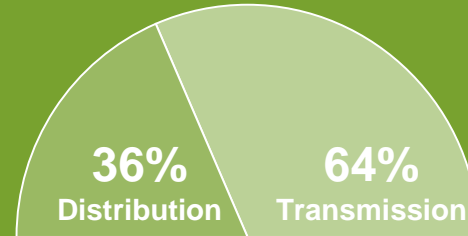
nationalgrid

Installed capacities location - 2030

Consumer Power – Total: 150GW



Total: 147GW - Two Degrees



27% 73%

Total: 100GW

34% 66%

Distribution Transmission

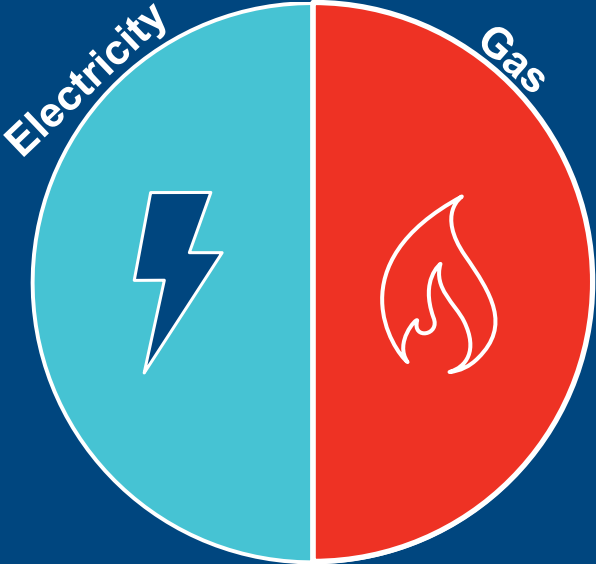
Steady State – Total: 116GW

41% 59%

Distribution Transmission

Total: 132GW - Slow Progression

Supply





Gas

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465 mcm

Jan 2010



114 mcm

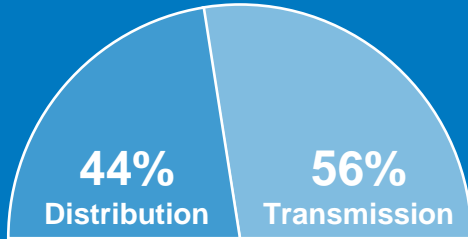
Sep 2012



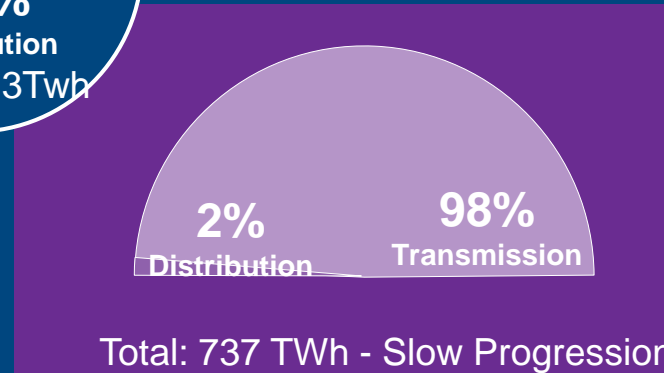
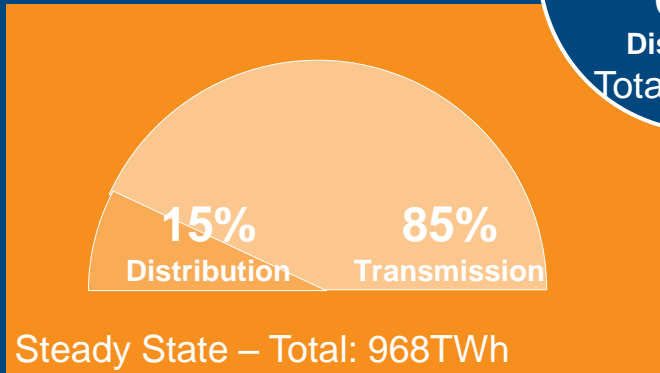
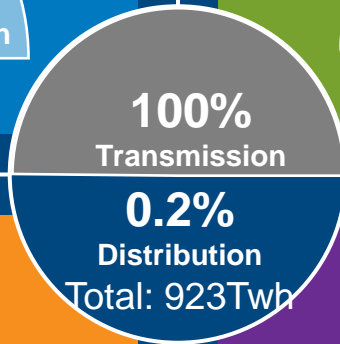
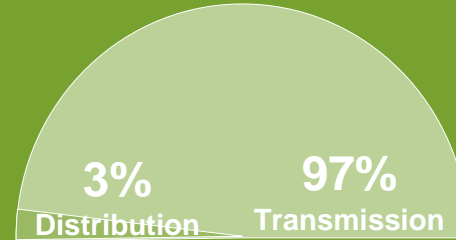
Gas

Distributed gas potential - 2030

Consumer Power – Total: 968TWh



Total: 671 TWh - Two Degrees





Gas

Indigenous Supply - 2050

Consumer Power



Imported gas

51%

Indigenous gas

49%

Two Degrees



Imported gas

87%

Indigenous gas

13%

55%



45%



Imported gas

79%

Indigenous gas

21%

Steady State



Imported gas

93%

Indigenous gas

7%

Slow Progression

2005

What next?

Luca Bruno / AP

2013

