Future Energy Scenarios 2018

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The energy landscape has been changing

Decarbonisation

400%

Increase in all renewable capacity since 2010

Decentralisation

3 times

More distributed capacity connected than in 2010

Digitalisation

12.3 mil

Smart and advanced meters in homes & businesses in GB

We are unsure of what the future holds

Uncertain Demand

3 to 11 million

Electric Vehicles driving on our roads by 2030

Uncertain Supply

37 to 50 GW

Of wind capacity generating on the system by 2030

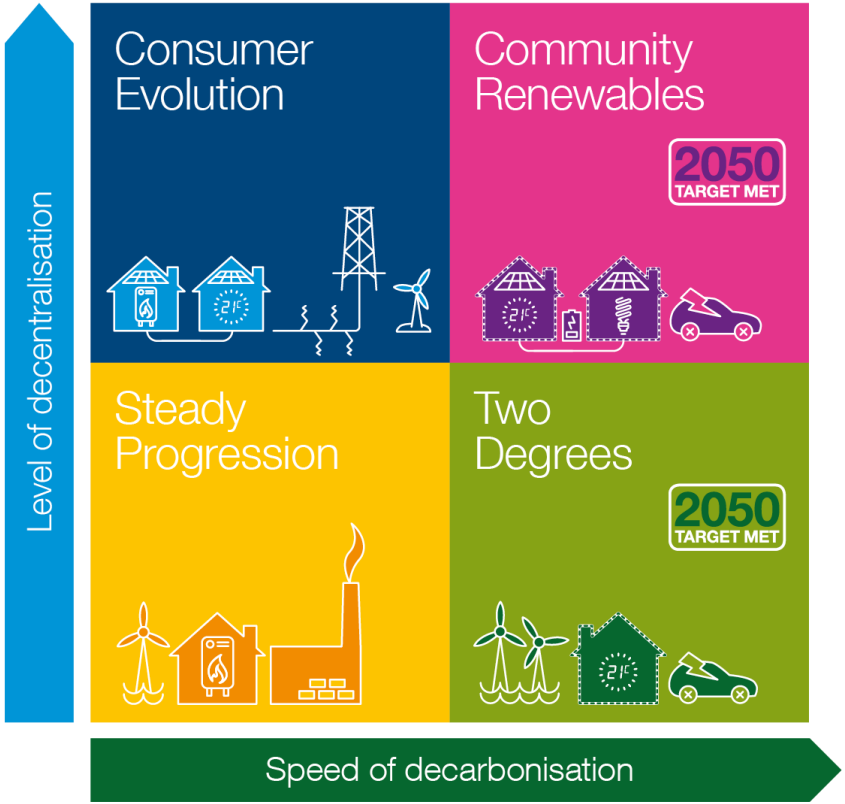
Uncertain Markets

10s to 1000s

Of active energy suppliers across the country by 2030

FES 2018

We use Scenarios to scope out potential worlds



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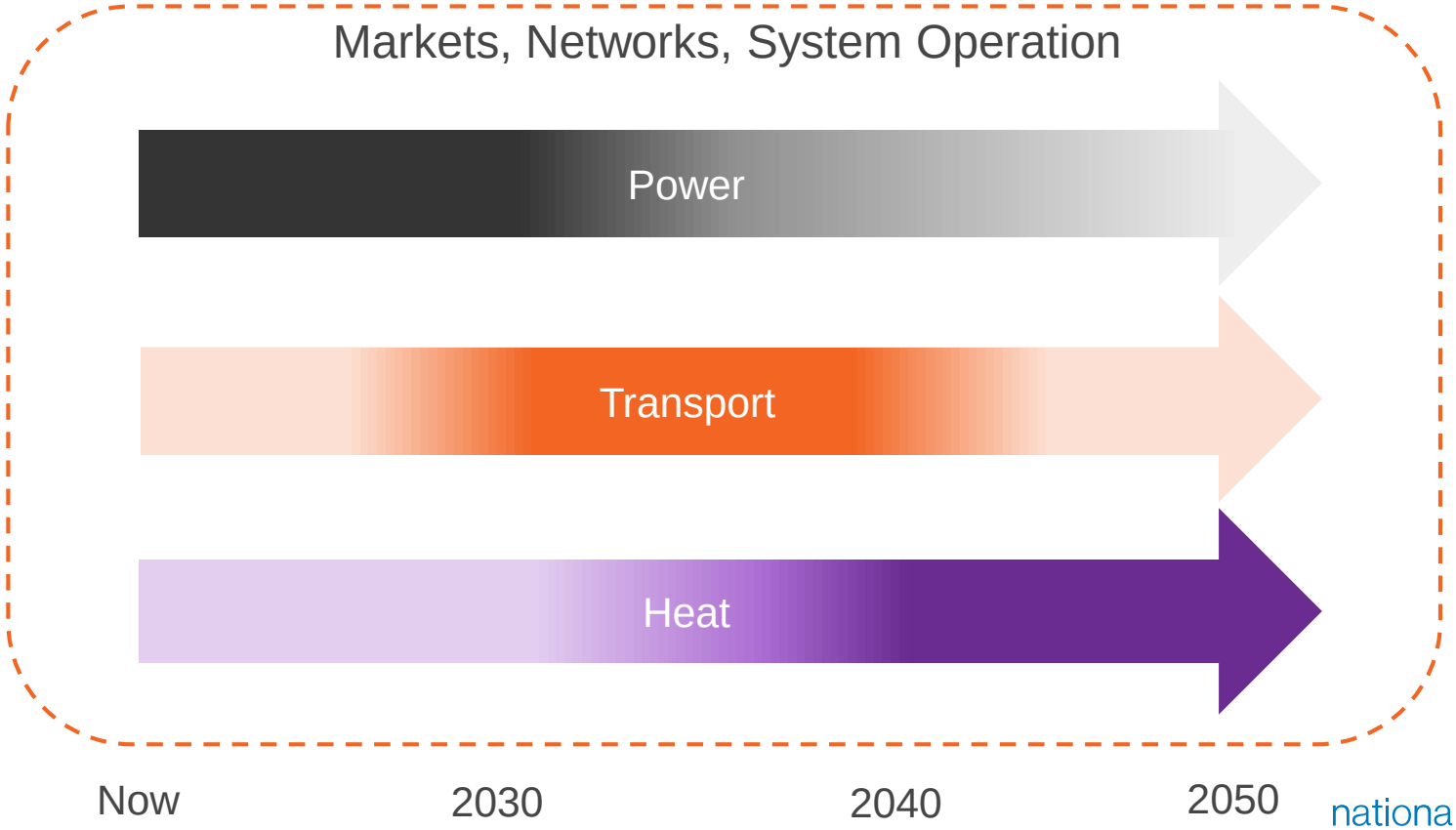
The energy transformation from now to 2050



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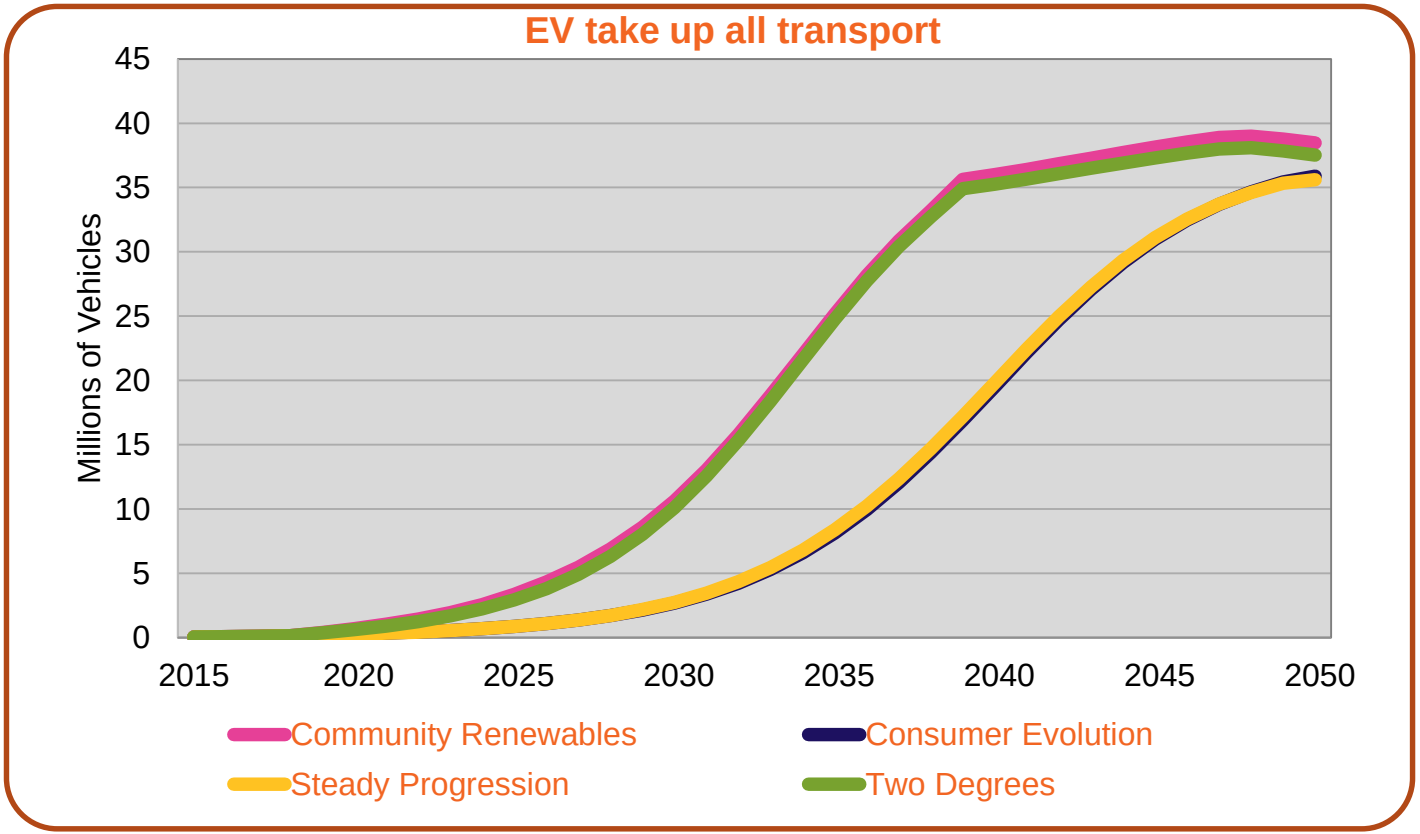
Transport

Electric vehicles increase in all our scenarios



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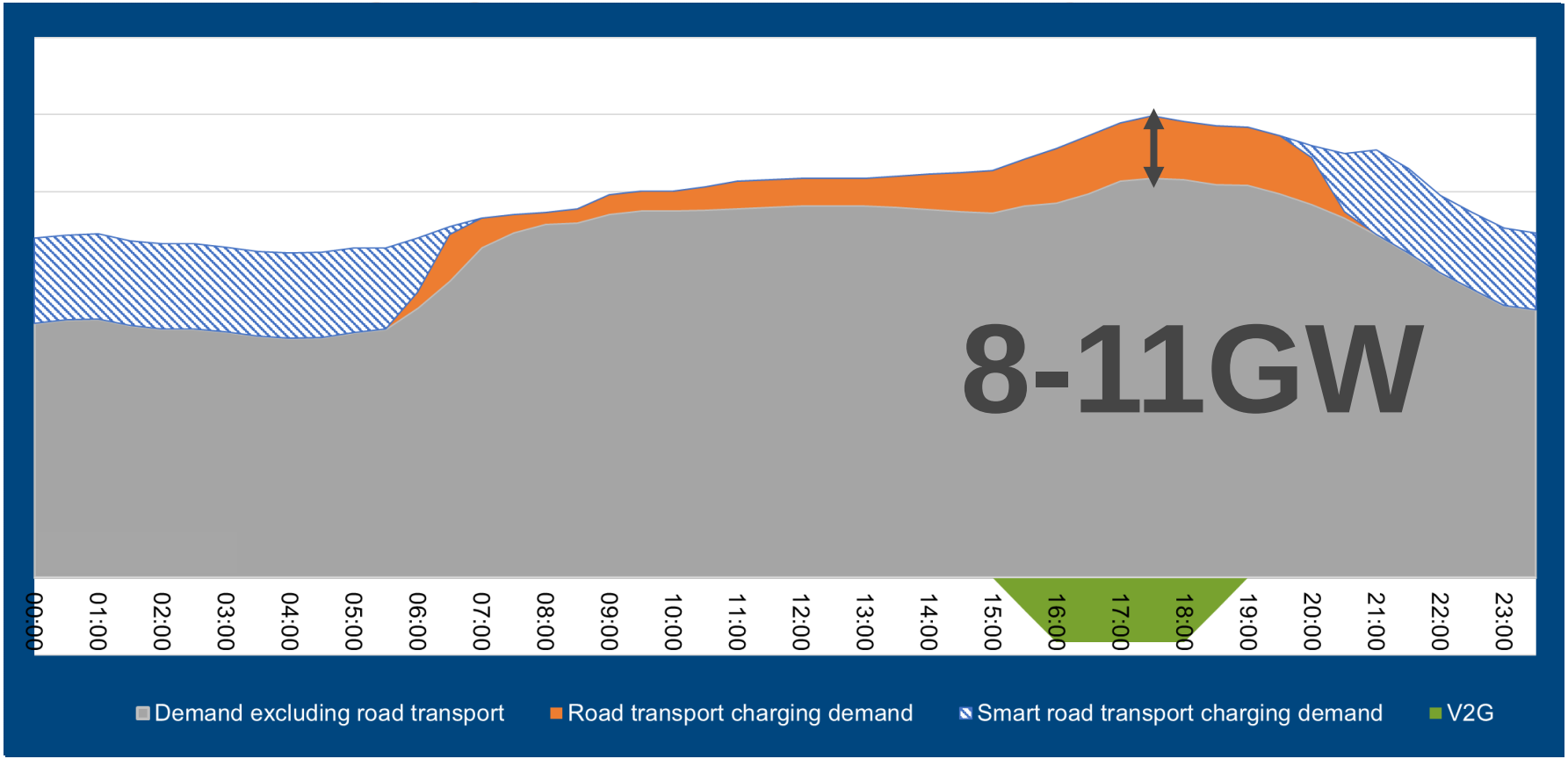
Smart charging - 2040 winter's day



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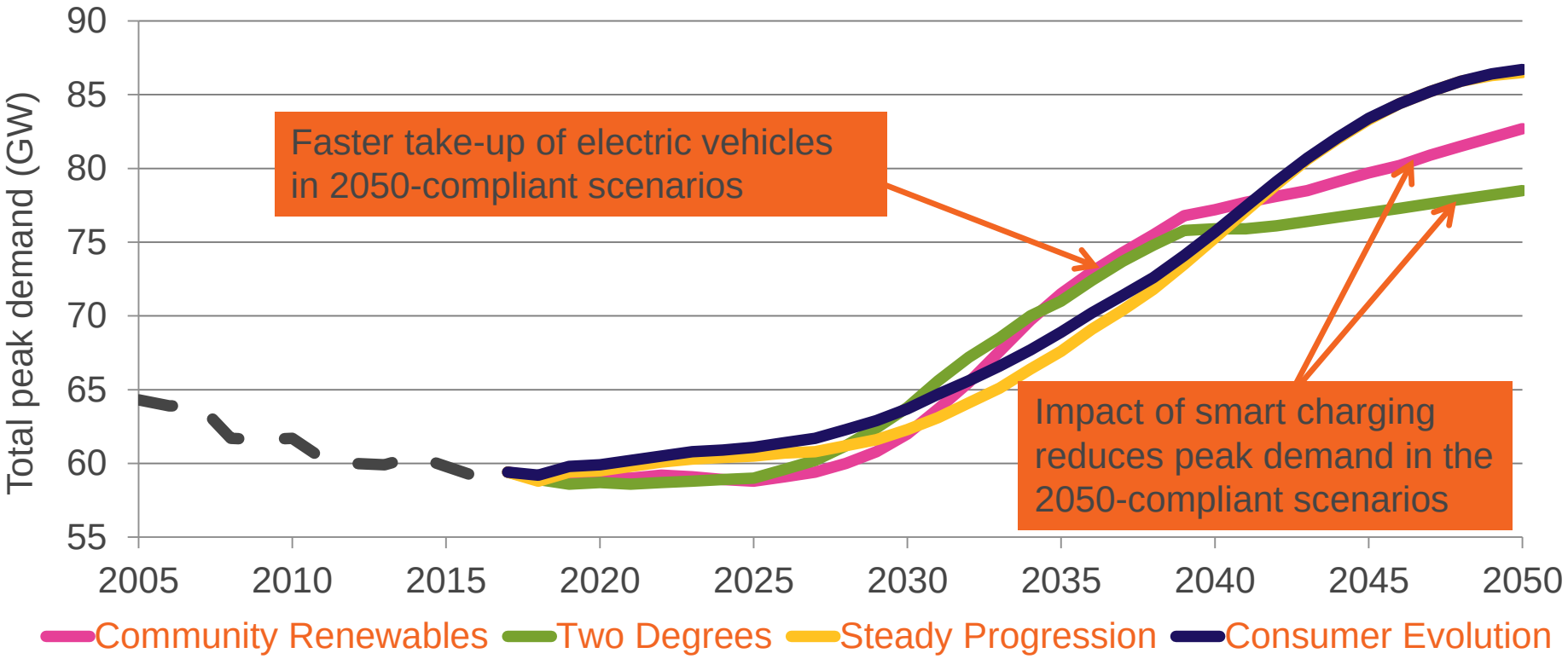
Total electricity peak demand



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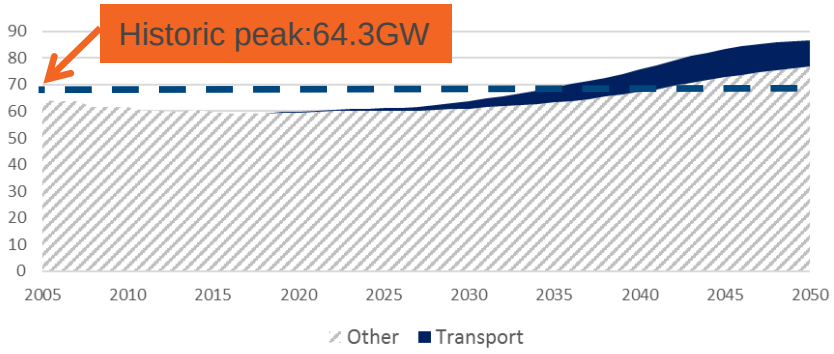
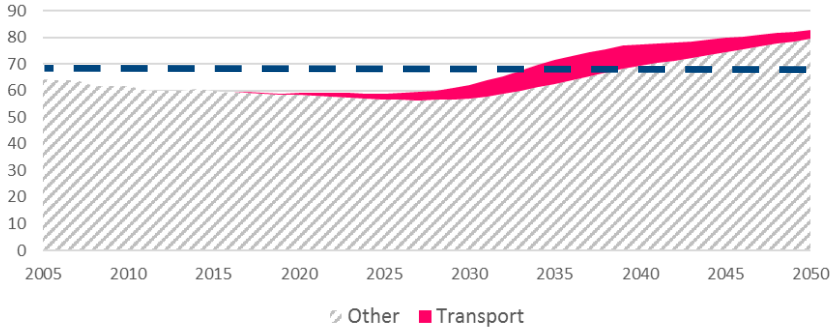
When will we see the impact on peak of EV demand?

Decentralisation

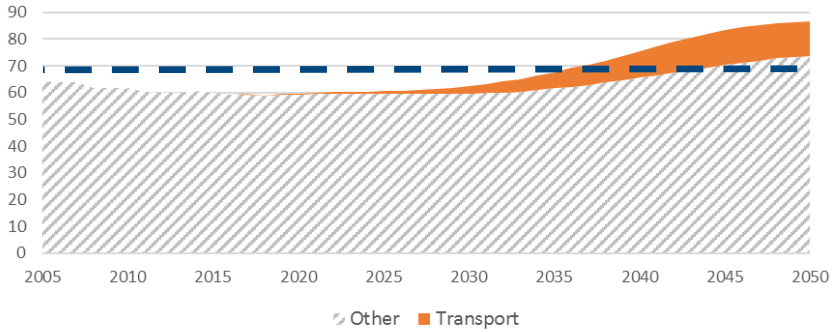
Consumer Evolution



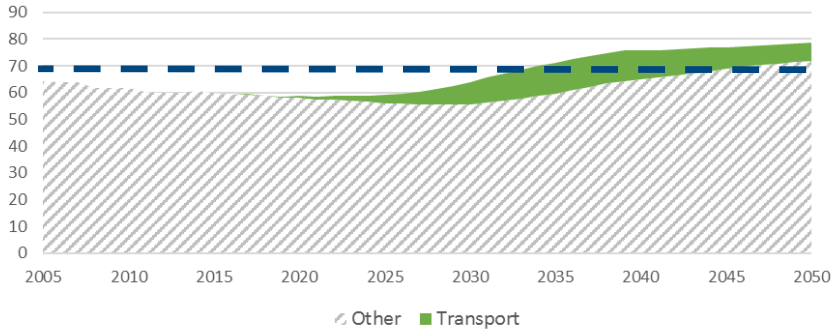
Community Renewables



Steady progression



Two Degrees



Decarbonisation

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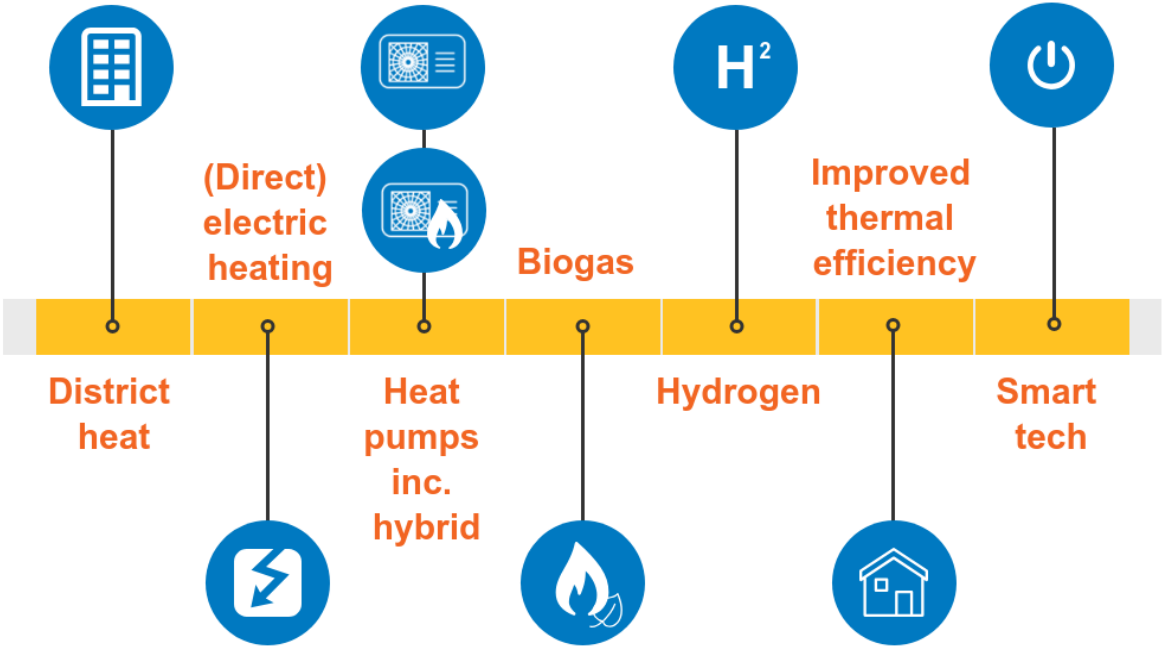
Heat

Options for decarbonising home heating…



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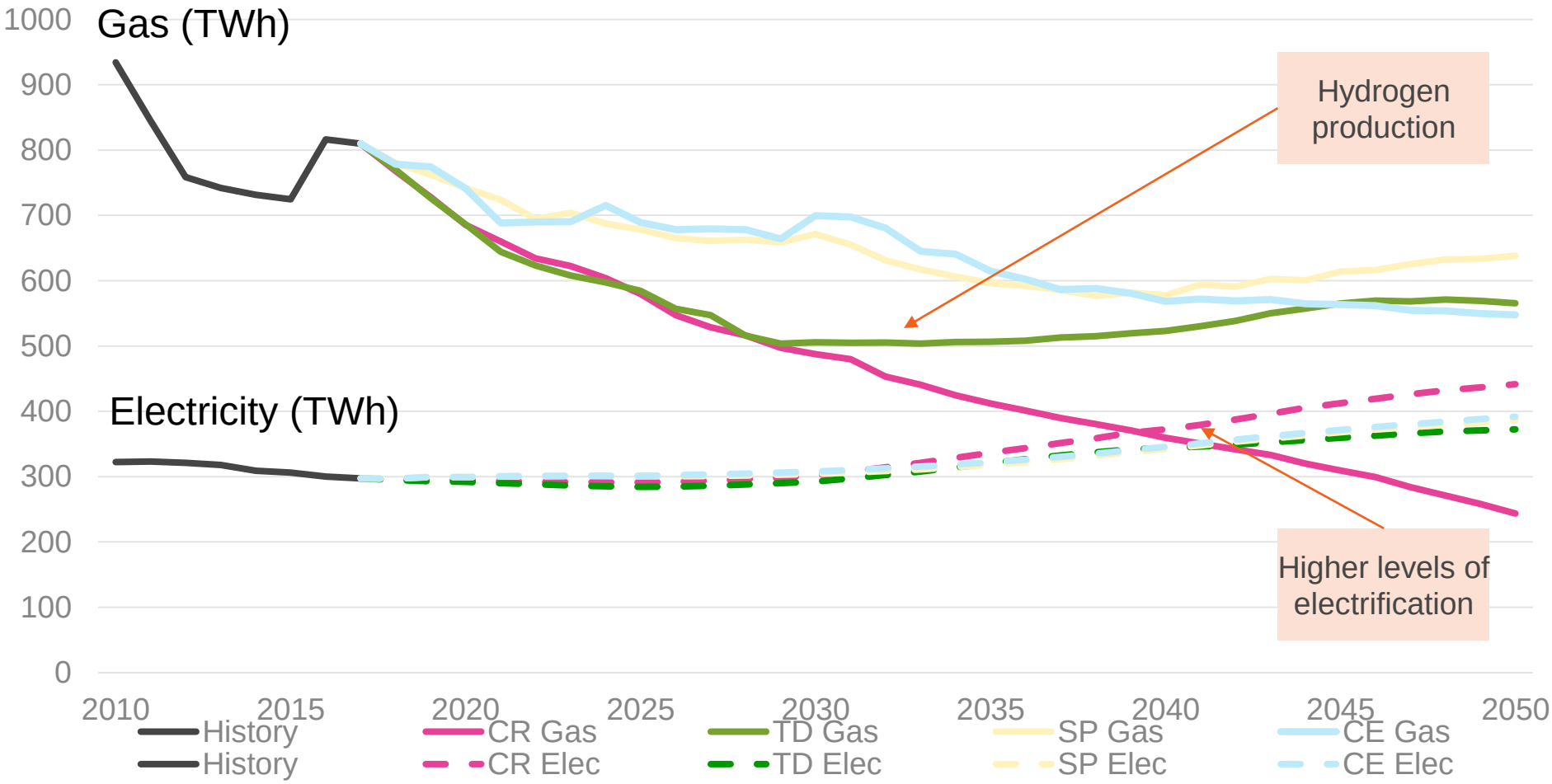
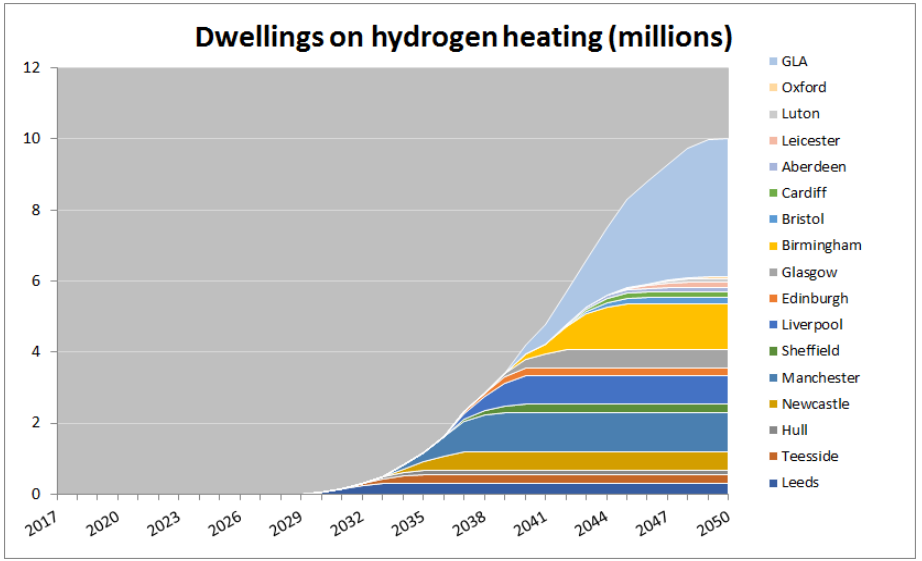
Residential heat in the 2050 compliant scenarios…

2050 figures	Community Renewables	Two Degrees
Hydrogen boilers	None	10 million
Heat pumps	15 million	6 million
Biogas	134 TWh	78 TWh
Homes on district heat	1.8 million	3.2 million
Hybrid HPs	3.5 million	2 million
Gas boilers	6.5 million	6.6 million
Thermal efficiency	95% of all buildings EPC class C or better	95% of all buildings EPC class C or better
Mt CO_2e	65 Mt from all heat	58 Mt from all heat

Impact on annual energy demand



Potential Hydrogen pathway…



Mass roll out of hydrogen dependent on CCUS

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Power Generation

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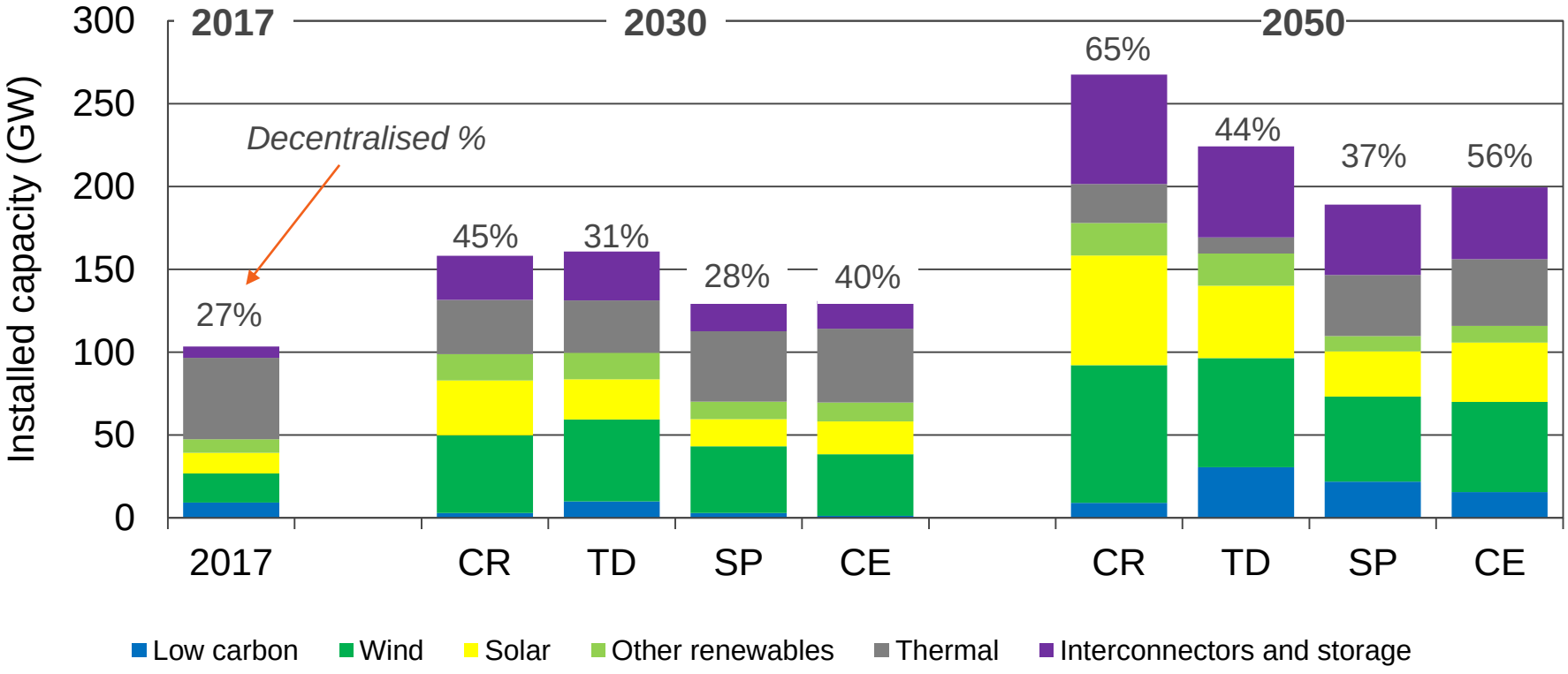
What does this mean for generation?



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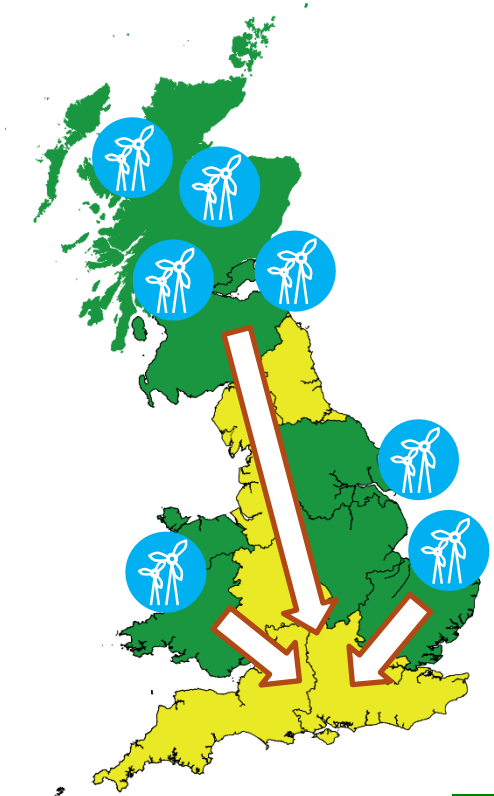
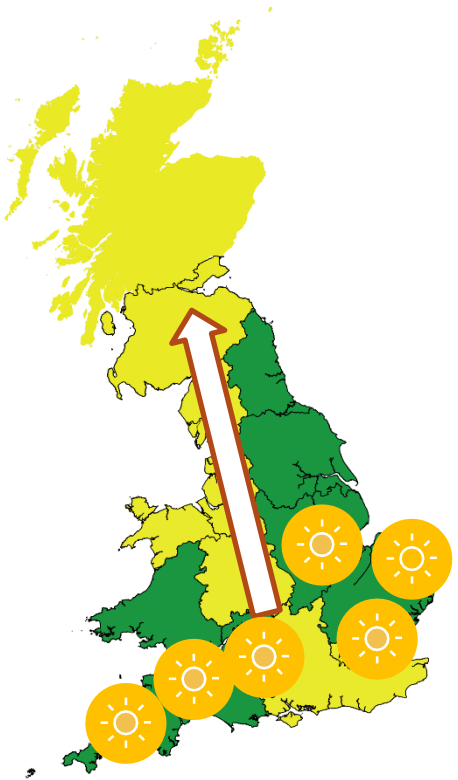
What does this mean for networks?

Winter 2030 in Community Renewables



Summer 2030 in Community Renewables



Net supply

Net demand

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Gas Supply

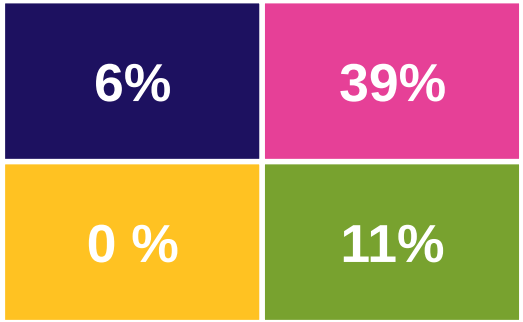
Gas supply: Themes 2017 vs 2050

UKCS depletion

38 bcm

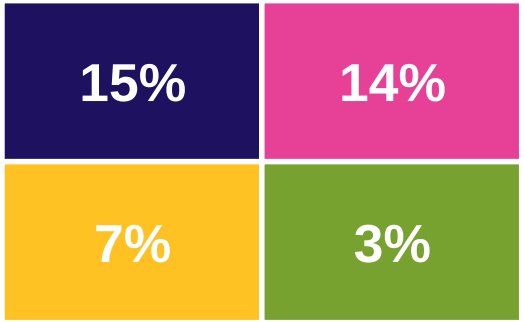
Decarbonised gas

<1%



Decentralised supply

<1 %



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FES 2018 key messages

1 A new energy world

2 Electric vehicle growth

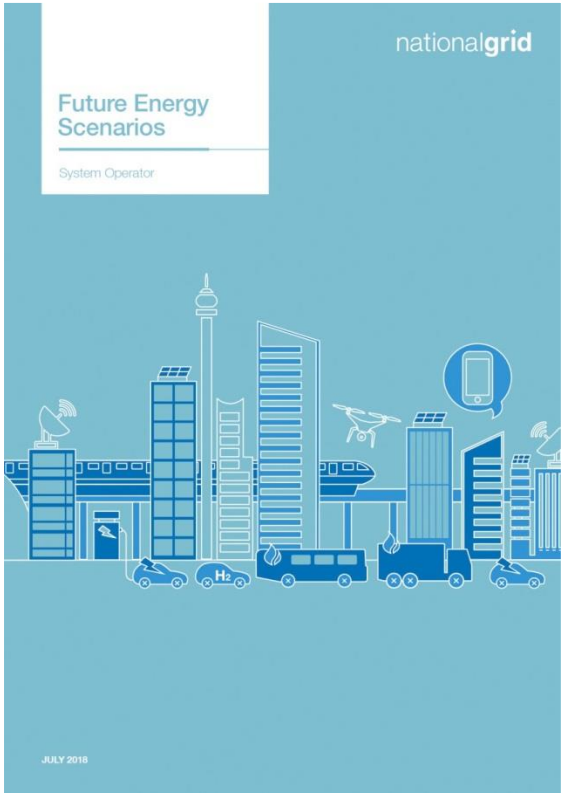
3 Action on heat

4 A role for gas

Appendix

Engagement and use of the scenarios

How do we use FES?



Network Options Assessment

Winter Review and Consultation

Gas Ten Year Statement

Summer Outlook Report

Winter Outlook Report

Gas Future Operability Planning

System Needs and Product Strategy

Electricity Ten Year Statement

System Operability Framework

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Who do we engage with for FES?

For FES2018 650 stakeholders from 430 organisations were involved

77

Customers
Energy suppliers, connection customers, shippers, terminal operators, generators, distribution network operators, directly connected demand, interconnectors and project developers.

15

Political
Great Britain's Government, devolved administrations, European departments and Parliament Members (Great Britain and EU).

1

Regulators
Great Britain's regulatory bodies (Ofgem, economic, environmental and safety) and EU regulatory bodies.

22

Educational interests
Academics, students, schools and universities.

10

Consumers
General public, consumer groups.

13

Supply chain
Suppliers and partners such as Alstom, GE and Siemens.

187

Energy industry
Transmission owners, balancing service providers, offshore gas companies, operating margin providers, European networks, industry bodies, EU TSO, associations and innovators (technology, environmental and manufacturing).

21

Non-government organisations
Environmental groups and interest groups.