

How to make the most of your ENTSO-E

QUESTIONS FOR THE DAY

GROUP 2

Scenario Workshop

JUNE 2016



Split per groups

Firstname	Last name	Group	Firstname	Last name	Group
Alexander	Scheibe	2	Kostis	Sakellaris	3
Alexander	Phillips	1	Manon	Dufour	2
Ali	Shahbazov	1	Marco	Gazzola	4
Andrei	Dumitru	3	Margherita	Salucci	1
Anton	Nordstram	3	Maria	Castro	4
Antonio	Gomez Bruque	2	Mark	Johnston	4
Celine	Heidrecheid	2	marta	navarrete	2
Cliff	Simon	3	Michael	Joerg	1
Daniel	Hosp	3	Mikolaj	Jasiak	3
David	McGowan	2	Niels	Franck	4
Eugen-Costinel	Mihalache	2	Olivier	Lebois	2
Frida	kieninger	2	Pekka	Vile	4
Gabor Miklos	Dudas	4	Philipp	Thaler	1
George	George	4	Pieter	Boersma	4
Gianluca	Flego	4	Roland	Joebstl	1
Heiko	Stubner	4	Sanjeev	Kumar	4
Idoia	Lejona	2	Siobhan	Hall	4
James	Gudge	3	Sophie	Westlake	2
Jan	Kostevc	3	Stefan	Dunke	3
Jean-Francois	Fauconnier	2	Stefano	Astorri	1
Jerome	Le Page	3	Sylvia	AngyalovÃ;	3
Jon	Gibbins	1	Thomas	Rzeczyk	3
Jorgen	Apfelbeck	1	Stefanie	Scheidl	1
Juan	Lopez-Vaquero	3	Victor	Charbonnier	2
Julia	Platona	1	Volker	Schippers	1
Kees	Alberts	4	William	De Riemaeker	1

Morning session. To warm
up towards scenario
development

Discussion about years and stories of scenarios

Question: Is it necessary to “connect the dots?” .

To have one storyline all the way from 2025 to 2040?

Pros and cons of the different of the different options? 10 min. per question

A storyline from point to point all the way from 2016 to 2040 (b and c):

Pros: Better indication to policy decisions

Improved assessment of infrastructure

We have a reference path to which we can compare how we are developing and adjust plans if necessary to get back on track.

Cons:

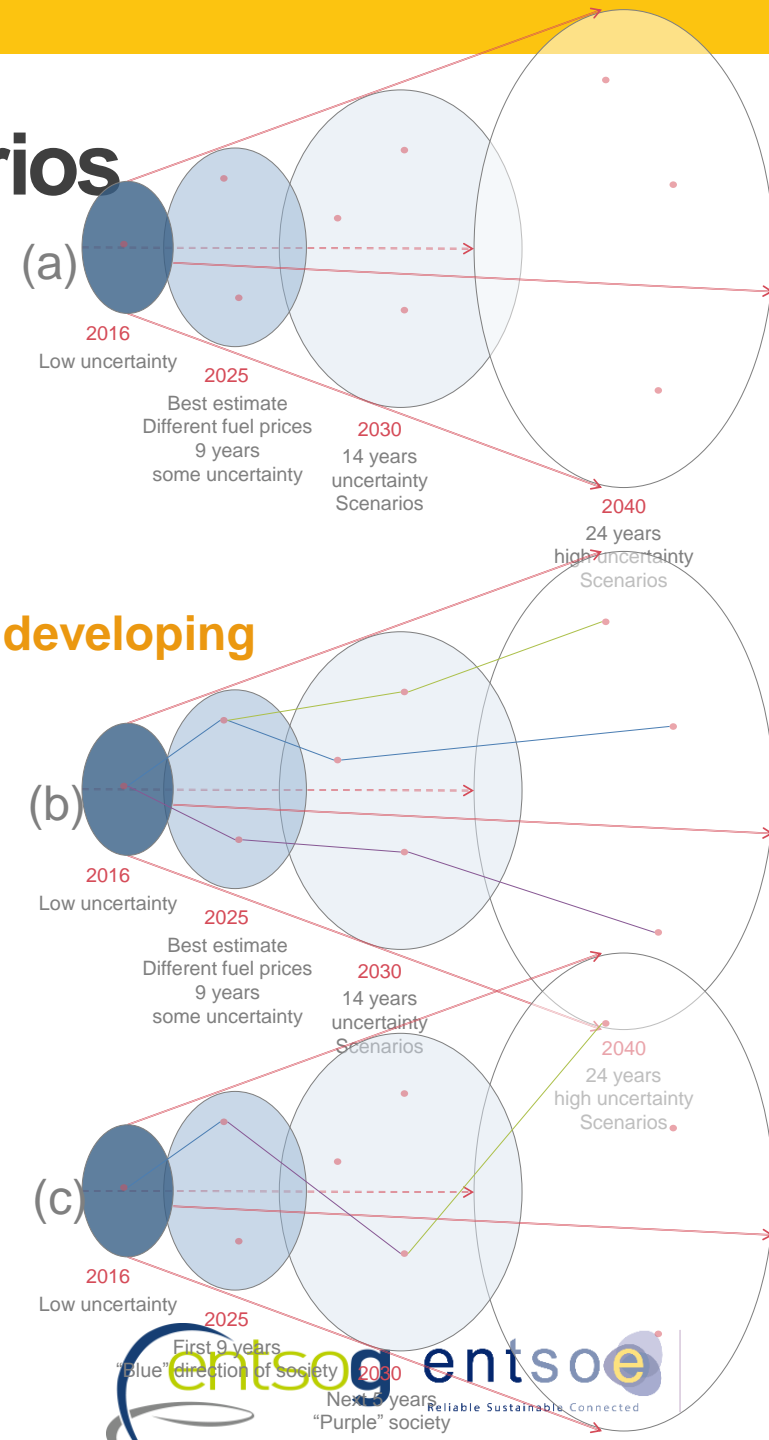
Multiplies number of cases & therefore the workload

Less possible futures / less flexibility

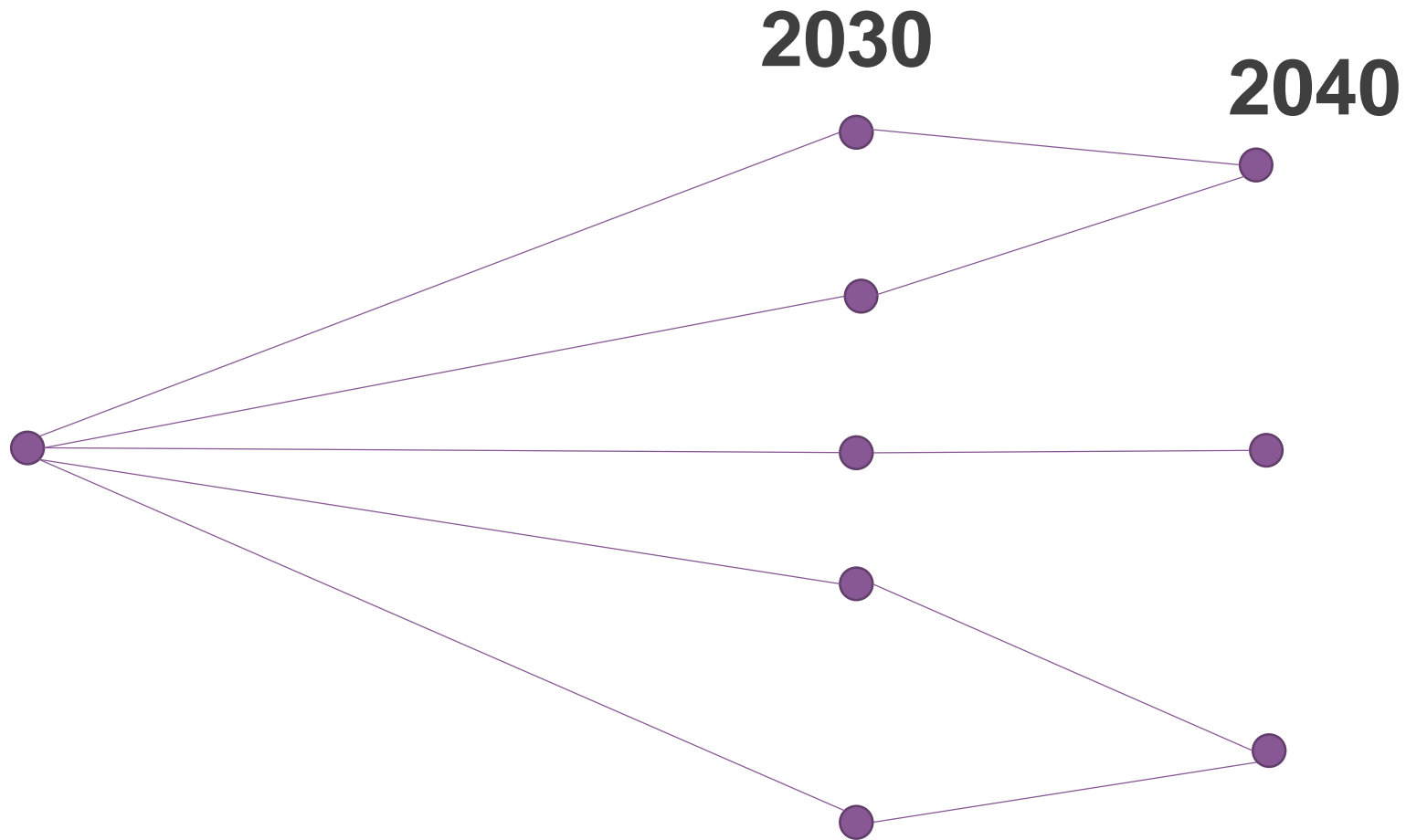
No storyline from point to point all the way from 2016 to 2040 (a):

Pros: More flexibility

Cons: Consistency between horizons



Alternative Path / Scenario Mix



**Suggestion for
3 scenarios in
2040
& possibly
more in 2030**

Discussion about years and stories of scenarios

Which assumptions are most uncertain for the near term (until 2025)?:

Policy

Regional SoS / low co-operation between states

Coal Retirements

Emission Trading System (ETS)

RES-E governance towards targets

Nuclear uncertainty, e.g. France 50% limit 2025

Storage

Level of Bio-Gas / Bio Methane uptake

Technology

Storage

Electric Vehicles (Costs)

Gas-Mobility

P2G ?

Market

Demand flexibility

Uptake of energy efficiency

Fuel prices,

Power 2 Gas (Maybe 2030)

Storage

Discussion about the use of coal and gas for power on the short time horizon (2025-2030)

What are the drivers towards gas being used before coal (Get people to write the answer on post it notes and sort in groups) (10 min)?

Regulatory or Political drivers:

National Standards rather than EU ETS.

EU Biogas Binding Targets.

Lowering Emissions to reach long term Goals.

Emissions Performance standards.

ETS will only develop if part of some form of Global mechanism.

Achievement of RES Target.

High ETS price.

Technological drivers:

Power to Gas (P2G), will increase potential for Gas to Power (G2P).

Hybrid Heat pumps for residential Areas.

High Efficiency Combined Cycle Gas Turbine Plants.

Flexibility of Gas Power Plants.

Need for more system flexibility due to increase RES

Economic drivers:

US Shale & increase in LNG infrastructure will impact on Gas Price.

Skyrocketing CO2 Prices.

Renewable Energy Sources Policies drive a need for Capacity Remuneration Mechanisms (CRM) for Gas Generation.

Appropriate market design e.g. no price caps.

End of subsidies to national coal

Other:

Acceptance from society that gas is cleaner than coal

Change from Coal to Gas Heating

How likely are these (drivers) to happen? (10 min)

Notes:

Strong effect	<p>CRM (capacity remuneration) for gas generation</p> <p>Phase out coal plants</p> <p>Emission performance standards</p> <p>ETS global market influence</p>	<p>ETS price</p> <p>High ETS price</p> <p>End of subsidies to national coal</p> <p>High efficiency CCGT</p> <p>US shale LNG impact on gas price</p> <p>Policy - EU targets on biogas</p> <p>Technology - P2G increasing potential for G2P</p> <p>Flexibility of gas-fired PP</p>	<p>Appropriate e-market design</p> <p>Need for more system flexibility due to increased RES</p> <p>Gas supply shale gas and increase in LNG)</p> <p>Policies lowering emissions to reach LT goals</p> <p>Achievement of RES targets</p> <p>Policy - National standards rather than ETS</p>
Little effect	<p>Economy – sky-rocketing CO2 prices</p>	<p>Technology - hybrid heat pumps in residential</p> <p>Society acceptance favouring gas against coal</p> <p>Change from coal heating to gas heating</p>	

Not likely

Medium likelihood

Do we have coal in power generation, heat and industry in 2040? (10 min)?

How many says yes:

1

How many says no:

7 (except as raw material for some industries)

Arguments for (2-3):

Minimal still in some countries (will not stand economically until 2040 in Poland)

Needed in industries such as steel as a raw material

Arguments against (2-3):

Is it feasible under a decarbonised scenario?

CCS not realistic for coal, no tackling other than CO2 emissions

Other remarks:

Lunch poster session: Select the three 2040 storylines that are considered worth developing for TYNDP?

Count of dots

Global climate action:

Subsidized Green Europe:

Sustainable Transition:

Behind Targets:

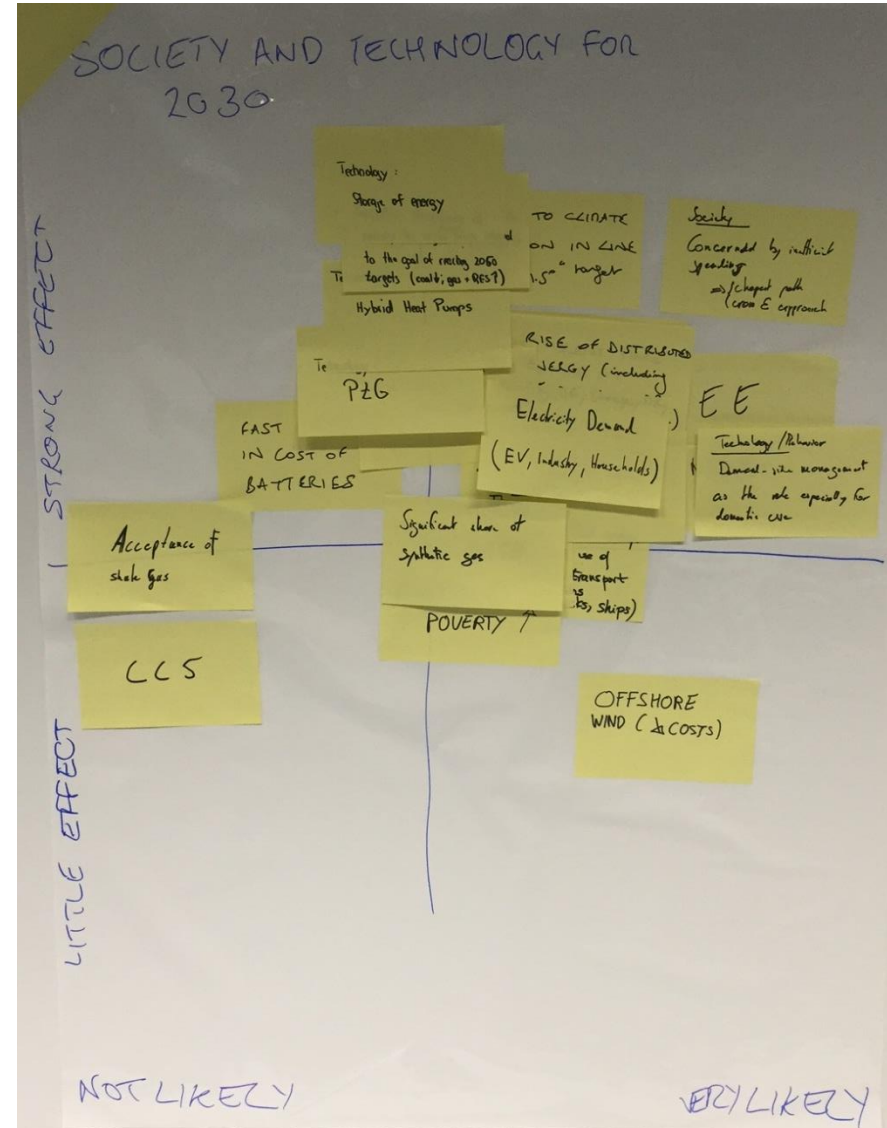
Distributed Generation:

Comments:

The storylines (storylines + matrix) will be put on the wall for the stakeholders to select the three they like consider worth developing further. They get **three** dots each so that they can put them on the posters.

Afternoon session. Build
your own scenario

Which relevant developments in society and technology do we need to represent in the scenarios for 2030?



Which *relevant developments in society and technology* do we need to represent in the scenarios for 2030?

Strong effect	Strong decrease in battery prices	Hybrid heat pump P2G Acceptance for high energy price / cost of transition Storage of energy Synthetic gas	Coal loses social license to operate Climate awareness Citizen more active/aware in eenrgy sector Decrease in gas production Move to climate ambition with 1.5 target Energy efficiency NYMBY Gas in transportation Electricity mobility Electricity demand (EV, heating...) Cross-energy grid planning Demand side management
Little effect	Acceptance EU shale gas CCS	Increase of energy poverty	Offshore costs
Not likelyVery likely			
<div>entsogentsoe</div> <div>Reliable Sustainable Connected</div>			

Build your own scenario (1,5 h)

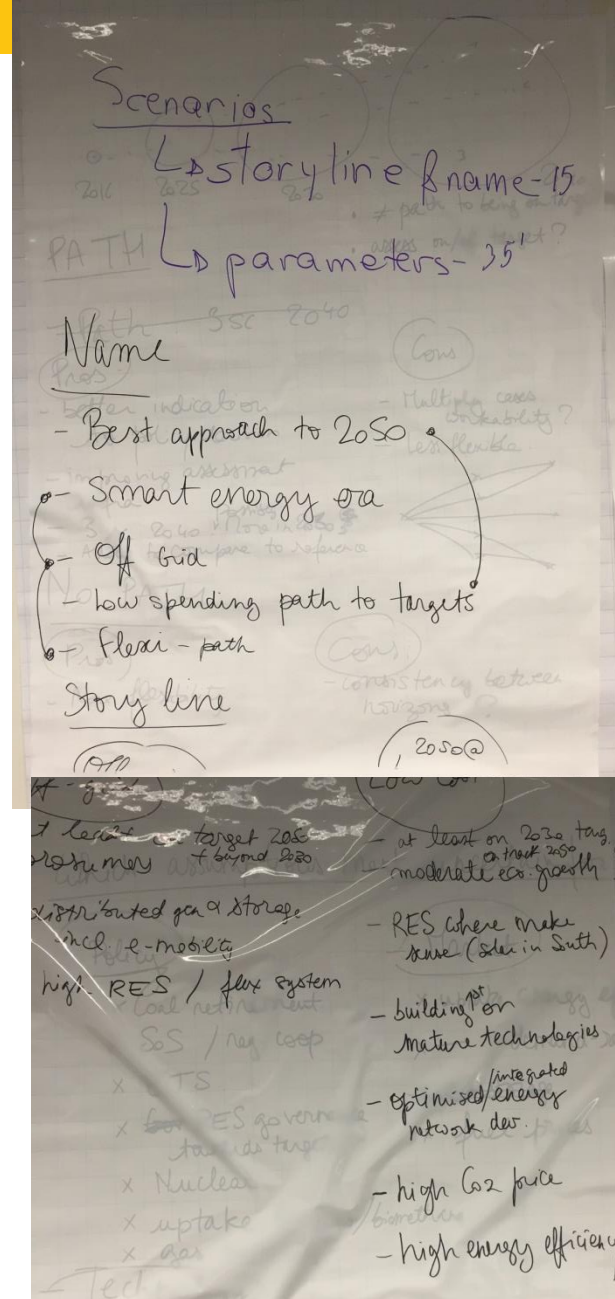
Ask the group to come up with a name for a scenario (or two). and build their own scenario (more if there is time)

Start with a blank flipchart: describe the scenario in short sentences. Three to four elements. The scenario should be plausible/believable.

Defining questions: Do you think we are on, above or below the climate target for 2030?

Defining storyline for your scenario? Example: nuclear, green ambitions, economics.

How do you imagine 2030?



2050 @ low cost

- On track to 2050 target , at least on track for 2030 targets
- Moderate economic growth
- RES development is where it makes more sense
- Use mature technologies first
- Optimised energy network develop
- CO2 price
- High energy efficiency

Community Off-Grid

- At least on 2050 targets and beyond 2030 ones.
- Community approach.
- Distributed generation and storage (incl. e-mobility).
- High RES, flexible system

Build Your Own Scenario

Our Vision
2030

"COMMUNITY" OFF GRID

Climate action driven by		ECONOMIC BENEFIT BY SOCIETY LOCAL INTERESTS
Macro economic Trends	EU on track to 2050 target?	Yes beyond 2030 target
	Economic conditions	MODERATE TO HIGH
Transport	Electric and hybrid vehicles	e-mobility growth + used as storage
	Gas vehicles	high growth FREIGHT
Residential / Commercial	Demand flexibility	high demand response
	Electric heat pump	MODERATE GROWTH
	Energy efficiency	High home insulation
	Hybrid heat pump	HIGH GROWTH
Industry	Electricity demand	STABLE
	Gas demand	STABLE
	Demand flexibility	HIGH
Power	Merit order	GAS BEFORE COAL
	Thermal plant	COAL RETIREMENT LIMITED EXTENSIONS NO NEW UNITS
Storage	Storage	DECENTRALIZED STORAGE
	Wind	HIGH GROWTH
	Solar	HIGH GROWTH
Adequacy	Adequacy	GOOD FLEXIBILITY NOT RELIANT ON THERMAL PLANT
	Power-to-gas	EMERGENT
	Gas Supply	No
Gas Supply	Shale Gas	No
	Bio Methane	HIGH GROWTH DECENTRALIZED

GRID TAKE THE REST OF EXISTING ON

OUR Vision
2030

2050 LOW COST

Climate action driven by		GLOBAL ECONOMIC SENSE EU INTERESTS
Macro economic Trends	EU on track to 2050 target?	YES ON TRACK 2030
	Economic conditions	MODERATE TO LOW
Transport	Electric and hybrid vehicles	HYBRID MATURE EX MODERATE GROWTH AT REPLACEMENT LEVEL
	Gas vehicles	MODERATE GROWTH NEW FLEET ON GAS
Residential / Commercial	Demand flexibility	HIGH DEMAND RESPONSE
	Electric heat pump	MODERATE GROWTH
	Energy efficiency	MODERATE GROWTH
	Hybrid heat pump	MODERATE GROWTH
Industry	Electricity demand	STABLE → DECREASING ↓
	Gas demand	
	Demand flexibility	HIGH
Power	Merit order	GAS BEFORE COAL
	Nuclear	MORE EXTENSIONS NO NEW UNITS
Storage	Storage	LIMITED USE OF EXISTING STORAGE WITH MODERATE GROWTH
	Wind	MODERATE TO HIGH ↓
	Solar	
	CCS	N/A
Adequacy	Adequacy	LESS RESERVE MARGINS
	Power-to-gas	MODERATE GROWTH
	Gas Supply	No
Gas Supply	Shale Gas	NO
	Bio Methane	HIGH GROWTH

This session
closes at 3:00
pm

Factor		
Scenario name		“COMMUNITY”OFF GRID
Category	Criteria	
Macroeconomic Trends	Climate action driven by	Society, Economic sense, local interests
	EU on track to 2050 target?	YES + beyond 2030 targets
	Economic conditions	MODERATE TO HIGH
Transport	Electric and hybrid vehicles	HIGH GROWTH + used as storage
	Gas vehicles and shipping	HIGH GROWTH
Residential / Commercial	demand flexibility	High demand response
	Electric heat pump	Moderate growth
	Energy efficiency	HIGH, home isolation, driven by society
	Hybrid heat pump	High growth
Industry	electricity demand	Stable (economic growth vs efficiency)
	gas demand	Stable (economic growth vs efficiency)
	demand flexibility	High
Power	Merit order	Gas before coal, coal retirement
	Nuclear	No new units and limited extensions
	Storage	Decentralised
	Wind	High growth
	Solar	High growth
	CCS	No
	Adequacy	Good flexibility, not reliant on thermal plant
Gas Supply	Power-to-gas	Emergent
	Shale Gas	No
	Bio Methane	High growth, decentralised
Other		

Factor		
Scenario name		2050 @ low cost
Category	Criteria	
Macroeconomic Trends	Climate action driven by	Economic sense, EU interests
	EU on track to 2050 target?	YES + on 2030 targets
	Economic conditions	MODERATE TO LOW
Transport	Electric and hybrid vehicles	EV moderate growth at replacement level. Hybrid mature
	Gas vehicles and shipping	Moderate growth. New fleet on gas
Residential / Commercial	demand flexibility	High demand response
	Electric heat pump	Moderate growth
	Energy efficiency	Moderate growth
	Hybrid heat pump	Moderate growth
Industry	electricity demand	Stable to decrease
	gas demand	Stable to decrease
	demand flexibility	High
Power	Merit order	Gas before coal
	Nuclear	No new units and some extensions
	Storage	Limited, use of existing gas storage, hydro moderate growth
	Wind	Moderate to high
	Solar	Moderate to high
	CCS	N/A
	Adequacy	Less reserve margins
Gas Supply	Power-to-gas	Moderate growth
	Shale Gas	No
	Bio Methane	High growth
Other		