



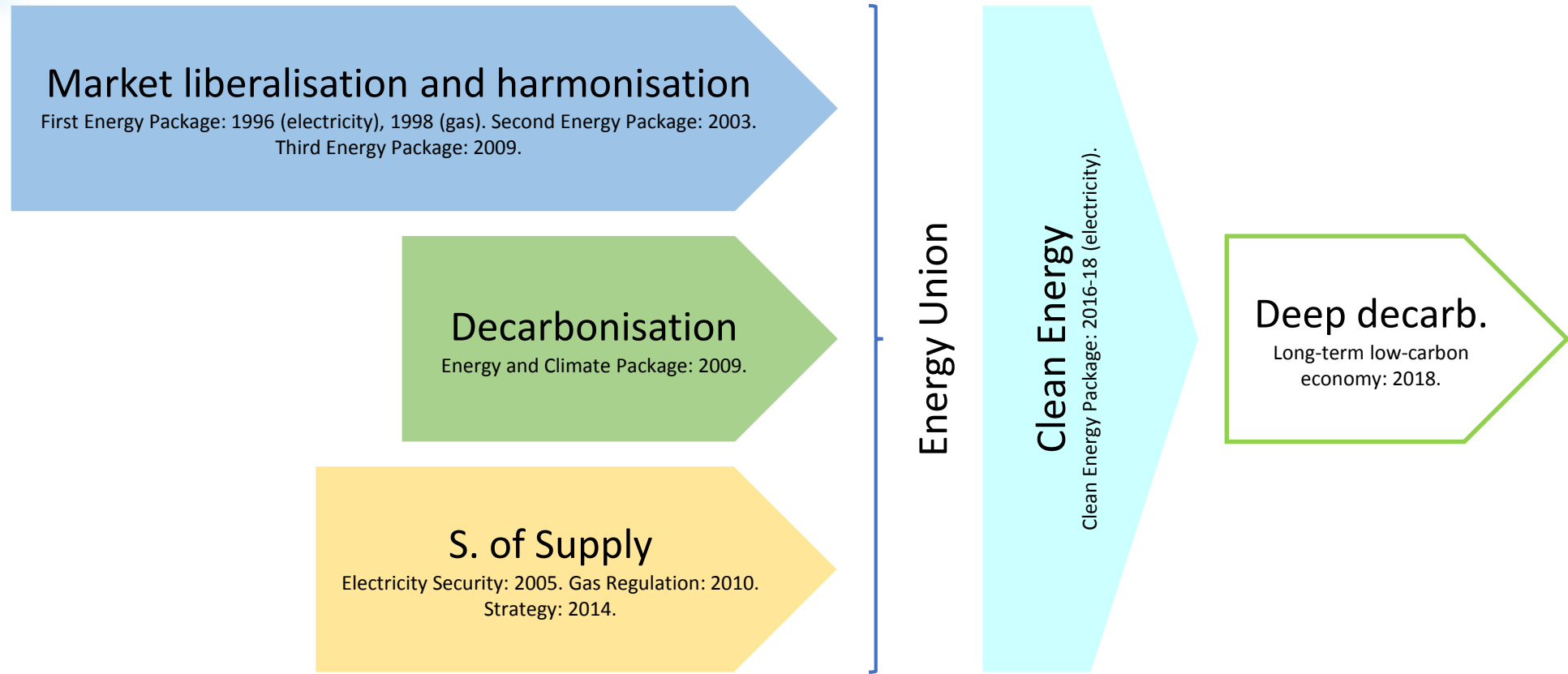
# Looking at the long-term: Role of gas in a net-zero Europe

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2018 Energy Community Gas Forum  
Ljubljana, Slovenia

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# EU energy objectives



# EU mid-century climate strategy

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- UN Paris Agreement (December 2015)
- EU Heads of Government request the European Commission to prepare “within one year a Strategy for long-term EU greenhouse gas emissions reduction in accordance with the Paris Agreement” (March 2018)
- Commission Communication (November 2018)

# Mid-century “deep decarbonisation”

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2050

-95% CO<sub>2</sub>

2070

-100% CO<sub>2</sub> (net-zero, including some negative emissions)

-86% greenhouse gases

# Which pathway ?

All-electric

"Gaseous fuels"

But all-electric might not work out simple or cheap ...

What are the possibilities for climate-compatible gas fuels and infrastructure?

Electricity is becoming green: All-electric looks like a simple answer for the energy transition



Is a multi-vector energy transition too complicated, or is it more affordable?

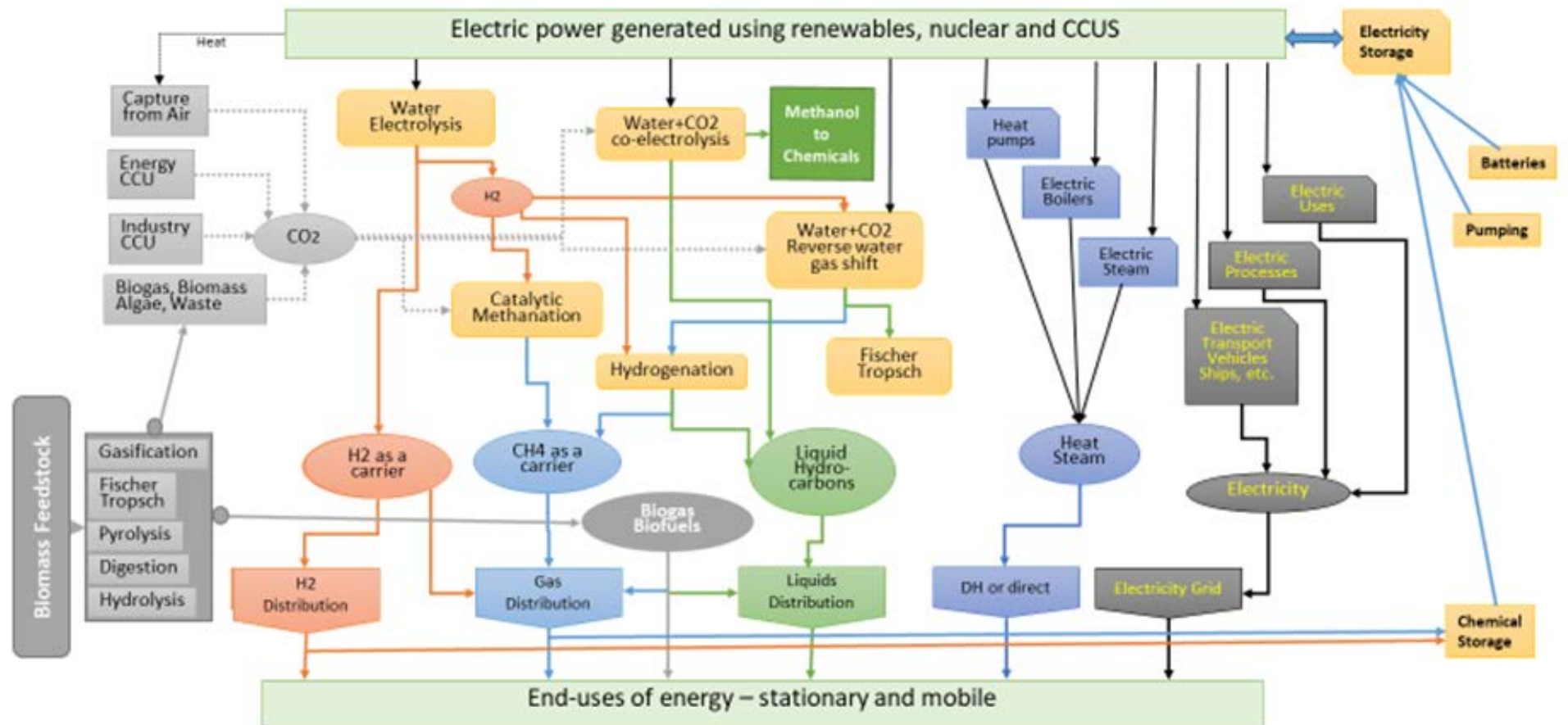
# Renewable and decarbonised gas

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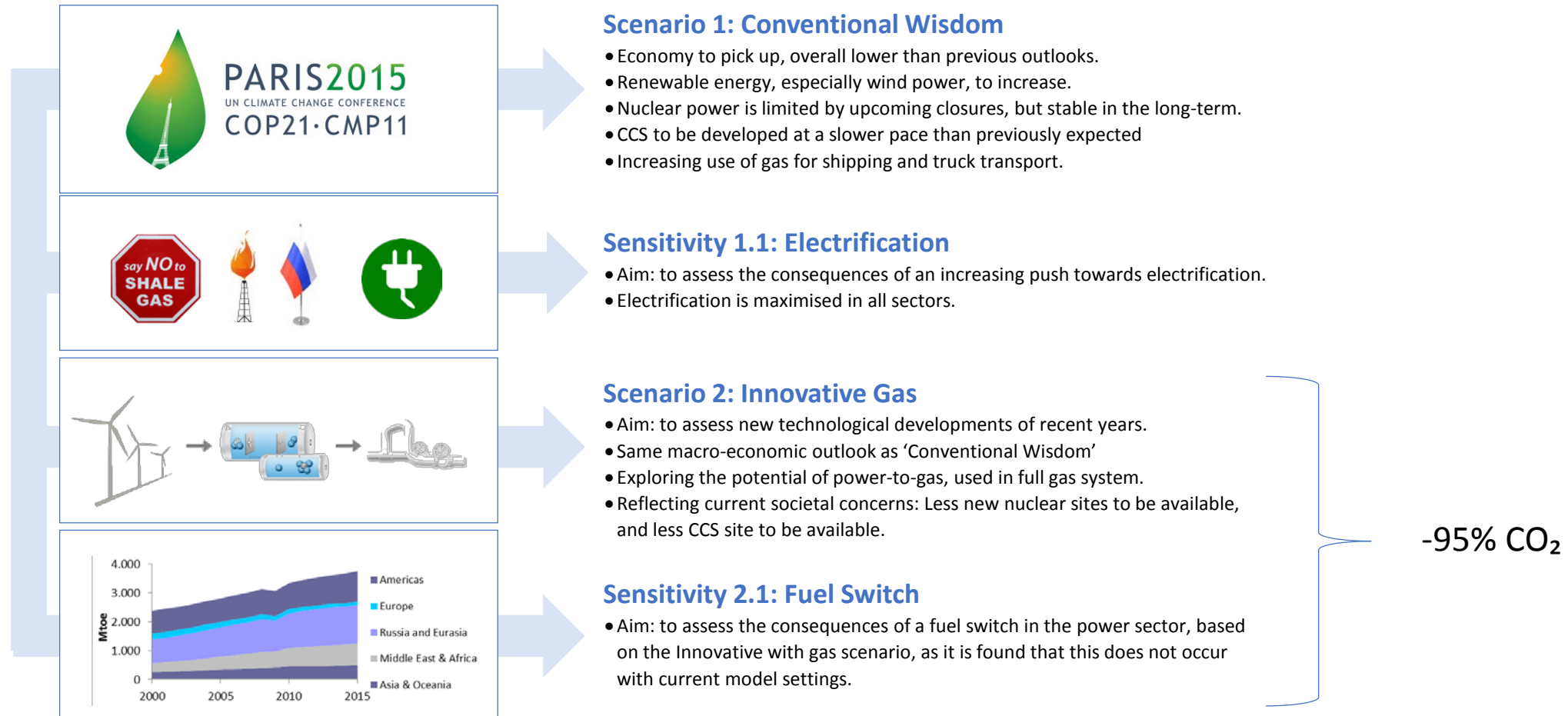
- CO<sub>2</sub>-neutral Green Hydrogen from Power-to-Gas (P2G) processes using renewable electricity
- CO<sub>2</sub>-neutral Blue Hydrogen produced from natural gas in combination with pre-combustion carbon capture and storage/use (CCS/U)
- Carbon negative Synthetic Methane produced from biogas or P2G in combination with post-combustion CCS
- CO<sub>2</sub>-neutral Biogas and Biomethane produced from municipal waste, agricultural residues and sewage

# Net-zero feedstocks and energy

Alternative pathways, in the PRIMES model (i.e. H<sub>2</sub>, e-gas, e-liquids, electrification)



# Eurogas scenarios study





# Into the future

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Equinor/Vattenfall/Gasunie: conversion to run on hydrogen of the three 440 MW Magnum units of Vattenfall Nuon in Eemshaven (MoU 2017).

H21 Leeds Citygate: conversion of existing natural gas demand and distribution to hydrogen in a city of 1½ percent of the UK population (launched 2017, completion 2025).



Causeway: Gas Networks Ireland will inject renewable gas into the Irish gas network for the first time (biomethane from anaerobic digestion of agricultural residues and by-products 2018).

L'Oréal USA/ Big Run Landfill in Ashland, Kentucky: corporate purchase agreement to offset company thermal load carbon footprint from manufacturing and distribution centres with biomethane for injection into the grid.

L'ORÉAL

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Thank you for your attention

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