A Clean Planet for all

A European strategic long term vision for a prosperous, modern, competitive and climate neutral economy
Political context

• Parties of the Paris Agreement to present long-term low greenhouse gas emission development strategies by 2020

• In October 2017 the European Parliament also invited the Commission "to prepare by COP24 a mid-century zero emissions strategy for the EU"

• In March 2018, European Council invited the Commission "to present by the first quarter of 2019 a proposal for a Strategy for long-term EU greenhouse gas emissions reduction".

• Regulation on Governance of the Energy Union calls on the Commission to present an EU long-term strategy by April 2019, including pathways that achieve net zero GHG emissions by 2050 and negative emissions thereafter
Climate challenges

- Global warming already reached at 1°C
- 18 of the warmest years in the last 2 decades and extreme heat waves in EU for 4 of the last 5 years
- Real impact on EU economy & environment
- IPCC warns about global eco-systems in danger already at 2°C
- Climate change undermines security and prosperity in the broadest sense
Our Vision for a Clean Planet by 2050

- The Paris Agreement objective is to keep temperature increase to well below 2°C and to pursue efforts to limit it to 1.5°C
- But the IPCC report confirms that limiting climate change to 1.5°C has to be pursued to avoid these worst impacts
- For the EU to lead the world in climate action, it means achieving net-zero greenhouse gas emissions by 2050
- The EU with this vision can inform others how we can deliver collectively a clean planet.
- The Long Term Strategy shows transforming our economy is possible and beneficial.
- It sets the direction of travel. No intention to revise the 2030 targets.
Our Vision for a Clean Planet by 2050

• EU leads in clean energy transition and GHG emissions reduction. Ambitious 2030 targets. 60% reductions in 2050 with current policies – not in line with the Paris Agreement.

• Radical transformations necessary: central role of energy system, buildings, transport, industry, agriculture.

• There are a number of pathways for achieving a climate neutral EU, challenging but feasible from a technological, economic, environmental and social perspective.
**Detailed assessment supported by scenario analysis**

### Long Term Strategy Options

<table>
<thead>
<tr>
<th>Main Drivers</th>
<th>Electrification (ELEC)</th>
<th>Hydrogen (H2)</th>
<th>Power-to-X (P2X)</th>
<th>Energy Efficiency (EE)</th>
<th>Circular Economy (CIRC)</th>
<th>Combination (COMBO)</th>
<th>1.5°C Technical (1.5TECH)</th>
<th>1.5°C Sustainable Lifestyles (1.5LIFE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GHG target in 2050</strong></td>
<td>Electrification in all sectors</td>
<td>Hydrogen in industry, transport and buildings</td>
<td>E-fuels in industry, transport and buildings</td>
<td>Pursuing deep energy efficiency in all sectors</td>
<td>Increased resource and material efficiency</td>
<td>Cost-efficient combination of options from 2°C scenarios</td>
<td>Based on COMBO with more BECCS, CCS</td>
<td>Based on COMBO and CIRC with lifestyle changes</td>
</tr>
<tr>
<td><strong>Major Common Assumptions</strong></td>
<td>• Higher energy efficiency post 2030</td>
<td>• Deployment of sustainable, advanced biofuels</td>
<td>• Moderate circular economy measures</td>
<td>• Digitilisation</td>
<td>• Market coordination for infrastructure deployment</td>
<td>• BECCS present only post-2050 in 2°C scenarios</td>
<td>• Significant learning by doing for low carbon technologies</td>
<td>• Significant improvements in the efficiency of the transport system</td>
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<tr>
<td><strong>Power sector</strong></td>
<td>Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization (demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.</td>
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<tr>
<td><strong>Industry</strong></td>
<td>Electrification of processes</td>
<td>Use of H2 in targeted applications</td>
<td>Use of e-gas in targeted applications</td>
<td>Reducing energy demand via Energy Efficiency</td>
<td>Higher recycling rates, material substitution, circular measures</td>
<td>Combination of most Cost-efficient options from “well below 2°C” scenarios with targeted application (excluding CIRC)</td>
<td>CIRC+COMBO but stronger</td>
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<tr>
<td><strong>Buildings</strong></td>
<td>Increased deployment of heat pumps</td>
<td>Deployment of H2 for heating</td>
<td>Deployment of e-gas for heating</td>
<td>Increased renovation rates and depth</td>
<td>Sustainable buildings</td>
<td>COMBO but stronger</td>
<td>CIRC+COMBO but stronger</td>
<td>• CIRC+COMBO but stronger</td>
</tr>
<tr>
<td><strong>Transport sector</strong></td>
<td>Faster electrification for all transport modes</td>
<td>H2 deployment for HDVs and some for LDVs</td>
<td>E-fuels deployment for all modes</td>
<td>Increased modal shift</td>
<td>Mobility as a service</td>
<td>Limited enhancement natural sink</td>
<td>• Dietary changes</td>
<td>• Enhancement natural sink</td>
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<tr>
<td><strong>Other Drivers</strong></td>
<td>H2 in gas distribution grid</td>
<td>E-gas in gas distribution grid</td>
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</table>
7 Building Blocks

1. Energy efficiency
2. Deployments of renewables
3. Clean, safe & connected mobility
4. Competitive industry and circular economy
5. Infrastructure and inter-connections
6. Bio-economy and natural carbon sinks
7. Tackle remaining emissions with carbon capture and storage
Enabling framework crucial to deliver transformation
Increased Investment in the EU economy

• Modernising and decarbonising the EU's economy will stimulate significant additional investment

• From 2% of EU GDP invested in the energy system today to 2.8% (up to € 575 bn per annum) to achieve a net-zero greenhouse gas emissions economy

• Important investments in the residential sector (energy efficiency) and the power sector (generation and grid).

• Co-benefits: energy imports down, public health, etc.
Just transition

- Overall economic impacts of the deep transformation are positive.
- The transition will spur growth in new sectors. 'Green jobs' already represent 4 million jobs in the EU.
- But some sectors will face challenges (e.g. coal mining and fuel extraction) and others will transform (e.g. energy-intensive industries and automotive sector).
- This will affect some regions often in lower income MS, more than others.
- Modernisation process has to be managed, no-one left behind, relevant policies must be deployed to the fullest. EU budget, employment and cohesion policies have a role.
- E.g. Platform and pilots for coal and carbon-intensive regions to be reinforced.
- Skill training is key
Role of citizens and local and regional authorities

• Moving towards a net-zero greenhouse gas economy can only be successful with citizens that embrace change, get engaged and experience it as beneficial for their lives and that of their children.

• Cities are already the laboratories for transformative and sustainable solutions with 75% of our population living in urban areas. City refurbishment and better spatial planning are drivers to renovate houses, improving living conditions, reducing travel time.

• The EU should capitalise on and expand the role of regions, cities and towns.

• Governance regulation creates a permanent multilevel climate and energy dialogue in Member States (Article 11)
Overriding priorities for action

• Accelerate the clean energy transition
• Strengthen the central role of citizens and consumers
• Roll out carbon-free, connected and automated mobility
• Boost industrial competitiveness, ensure competitive markets
• Promote a sustainable bio-economy, safeguard our natural resources
• Strengthen infrastructure and make it climate proof
• Accelerate R&I and entrepreneurship on zero-carbon solutions
• Promote sustainable finance and investment
• Invest in human capital, education and training skills
• Align growth-enhancing policies (competition, labour, skills, cohesion, taxation, etc.) with energy and climate policies
• Fair transition, coordinate with Member States and regions
• Continue international collaboration, bring all on board, share knowledge
Thank you