

**List of some of the most recent and widely recognized studies proposing one or more hydrogen demand scenarios for 2030, 2040 and 2050 by sector (industry, transport, buildings and electricity) in the Europe.**

<b>Title of the study</b>	<b>Author(s)</b>	<b>Date of publication</b>	<b>Link to the study</b>
Analysing future demand, supply, and transport of hydrogen	Guidehouse - European Hydrogen Backbone	June 2021	<a href="#">Click here</a>
Study on Hydrogen in Ports and Industrial Coastal Areas	Deloitte - Clean Hydrogen Partnership	March 2023	<a href="#">Click here</a>
Hydrogen roadmap Europe: A sustainable pathway for the European energy transition	FCH JU ( <i>now renamed Clean Hydrogen Partnership</i> )	January 2019	<a href="#">Click here</a>
Enabling the European hydrogen economy	Aurora Energy Research	May 2021	<a href="#">Click here</a>
TYNDP 2022 – Scenario Report	ENTSO-G & ENTSO-E	April 2022	<a href="#">Click here</a>
Energy Outlook 2020 edition - <i>Net-zero scenario</i>	BP	2020	<a href="#">Click here</a>
Paris Agreement Compatible Scenarios for Energy Infrastructure (PAC)	Climate Action Network (CAN) Europe	June 2020	<a href="#">Click here</a>
Energy transition outlook (ETO) - Net-zero scenario	DNV	2021	<a href="#">Click here</a>
Transition pathways to a carbon neutral EU28 - Tech scenario	EUCalc	2020	<a href="#">Click here</a>
Achieving the Paris Climate Agreement Goals - 1.5 scenario	IFS	2019	<a href="#">Click here</a>
JRC EU TIMES - Net Zero scenario,	Joint Research Centre of the European Commission	2021	<a href="#">Click here</a>
Global Energy and Climate Outlook (GECO) - 1.5°C Differentiated scenario	Joint Research Centre of the European Commission	2021	<a href="#">Click here</a>
Net-Zero Europe: decarbonisation pathways and socioeconomic implications – Cost Optimal and Breakthrough scenarios	McKinsey	2020	<a href="#">Click here</a>
Fit-for-55	European Commission	2022	For 2030: <a href="#">Click here</a> For 2040 and 2050: <a href="#">Click here</a>
REPowerEU	European Commission	2022	<a href="#">Click here</a>
A Clean Planet For All	European Commission	2018	<a href="#">Click here</a>
Impact assessment SWD 176 - MIX	European Commission	2020	<a href="#">Click here</a>

### Sectorial scope and key assumptions & narratives for some of the most recent and widely recognized studies proposing one or more hydrogen demand scenarios for 2030, 2040 and 2050 by sector in Europe.

Title of the study	Author(s)	Year of publication	Link to the study	Sectorial scope	Key assumptions and narratives
Analysing future demand, supply, and transport of hydrogen	Guidehouse - European Hydrogen Backbone	2021	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li><b>Industry: Yes.</b> <i>Includes:</i> Iron &amp; steel; Ammonia for fertilizers; High Value Chemicals (HVCs); Refining &amp; fuel production; Industrial process heat (low, medium and high temperature).</li> <li><b>Transport: Yes.</b> <i>Includes:</i> Road transport (only heavy-duty road freight), aviation and shipping.</li> <li><b>Power sector: Yes.</b></li> <li><b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>Policy measures are put in place that prevent relocation of existing industries outside of Europe.</li> <li>The hydrogen demand for synthetic fuels is categorized under "Industry" and not (as in most of the other studies) under "Transport".</li> <li>No direct hydrogen or hydrogen derived fuels in the shipping sector.</li> <li><b>See pages 85 to 97 of the study.</b></li> </ul>
Study on Hydrogen in Ports and Industrial Coastal Areas	Deloitte - Clean Hydrogen Partnership	2023	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li><b>Industry: Yes.</b> <i>Includes:</i> Iron &amp; steel; Ammonia for fertilizers; Methanol; High Value Chemicals (HVCs); Refining; Industrial process heat (low, medium and high temperature).</li> <li><b>Transport: Yes.</b> <i>Includes:</i> Road transport (only heavy-duty road freight), international shipping, domestic shipping and port activities (cargo handling and port vessels). Aviation is out of scope.</li> <li><b>Power sector: No.</b></li> <li><b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>Policy measures are put in place that prevent relocation of existing industries outside of Europe.</li> <li><b>See pages 55 to 68 of the study.</b></li> </ul>
Hydrogen roadmap Europe: A sustainable pathway for the European energy transition	FCH JU <i>(now renamed Clean Hydrogen Partnership)</i>	2019	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li><b>Industry: Yes.</b> <i>Includes:</i> Iron &amp; steel; Ammonia for fertilizers; Methanol; High Value Chemicals (HVCs); Refining; Industrial process heat (low, medium and high temperature).</li> <li><b>Transport: Yes.</b> <i>Includes:</i> Road transport, shipping and aviation.</li> <li><b>Power sector: Yes.</b></li> <li><b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li><b>See page 18 of the study.</b></li> </ul>
Enabling the European hydrogen economy	Aurora Energy Research	2021	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li><b>Industry: Yes.</b> <i>Includes:</i> Iron &amp; steel; Ammonia for fertilizers; Methanol; High Value Chemicals (HVCs); Refining; and Cement.</li> </ul>	<ul style="list-style-type: none"> <li>In the "low" scenario, the size of the European industrial sector will "shrink" by 2050.</li> <li><b>See pages 8 and 9 of the study.</b></li> <li>No direct hydrogen or hydrogen derived fuels in the power sector.</li> </ul>

				<ul style="list-style-type: none"> <li>• <b>Transport: Yes.</b> <u>Includes:</u> Road transport (mainly heavy-duty road freight), shipping and aviation.</li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	
TYNDP 2022 – Scenario Report	ENTSO-G & ENTSO-E	2022	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b> <u>Includes:</u> energy use (ex: Iron &amp; steel) and non-energy use (ex: Ammonia for fertilizers; Methanol; High Value Chemicals (HVCs); Refining).</li> <li>• <b>Transport: Yes.</b> <u>Includes:</u> Road transport (heavy-duty trucks, passenger cars, light trucks, buses, rail), shipping and aviation.</li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul> <p><b>All numbers available <a href="#">here</a> “Download demand figures (excel)”.</b></p>	<ul style="list-style-type: none"> <li>• <b>See pages 12 to 15 of the study</b></li> <li>• <b>All assumptions available <a href="#">here</a>.</b></li> </ul>
Energy Outlook 2020 edition - Net-zero scenario	BP	2020	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b> <u>Includes:</u> Existing industry feedstock use (ammonia, refineries and methanol and new energy use (ex: Steel)</li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• No direct hydrogen or hydrogen derived fuels in the power sector.</li> <li>• <b>Note:</b> <i>Data gathered from JRC Technical Report (2022) “The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050”.</i> For more information, see section “Scenario selection” (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>
Paris Agreement Compatible Scenarios for Energy Infrastructure (PAC)	Climate Action Network (CAN) Europe	2020	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• No direct hydrogen or hydrogen derived fuels in the power and building sectors.</li> <li>• <b>Note:</b> <i>Data gathered from JRC Technical Report (2022) “The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050”.</i> For more information, see section “Scenario selection” (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>
Energy transition outlook (ETO) - Net-zero scenario	DNV	2021	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• No direct hydrogen or hydrogen derived fuels in the power sector.</li> <li>• <b>Note:</b> <i>Data gathered from JRC Technical Report (2022) “The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050”.</i> For more information, see section “Scenario selection” (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>

Transition pathways to a carbon neutral EU28 - Tech scenario	EUCalc	2020	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• No direct hydrogen or hydrogen derived fuels in the power and building sectors.</li> <li>• <b>Note:</b> Data gathered from JRC Technical Report (2022) "The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050". For more information, see section "Scenario selection" (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>
Achieving the Paris Climate Agreement Goals - 1.5 scenario	IFS	2019	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Note:</b> Data gathered from JRC Technical Report (2022) "The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050". For more information, see section "Scenario selection" (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>
JRC EU TIMES - Net Zero scenario,	Joint Research Centre of the European Commission	2021	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• No direct hydrogen or hydrogen derived fuels in the power sector.</li> <li>• No direct hydrogen or hydrogen derived fuels in the building sector in 2050 (small quantities in 2030/2040).</li> <li>• <b>Note:</b> Data gathered from JRC Technical Report (2022) "The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050". For more information, see section "Scenario selection" (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>
Global Energy and Climate Outlook (GECO) - 1.5°C Differentiated scenario	Joint Research Centre of the European Commission	2021	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• No direct hydrogen or hydrogen derived fuels in the power sector.</li> <li>• <b>Note:</b> Data gathered from JRC Technical Report (2022) "The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050". For more information, see section "Scenario selection" (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>
Net-Zero Europe: decarbonisation pathways and socioeconomic implications – Cost Optimal and	McKinsey	2020	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Note:</b> Data gathered from JRC Technical Report (2022) "The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050". For more information, see section "Scenario selection" (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a></li> </ul>

Breakthrough scenarios					
Fit-for-55	European Commission	2022	For 2030: <a href="#">Click here</a> For 2040 and 2050: <a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b> <u>Includes:</u> Iron &amp; steel; Ammonia for fertilizers; Refining; Industrial heat.</li> <li>• <b>Transport: Yes.</b> <u>Includes:</u> Road transport (Transport); Aviation (synthetic fuels); Maritime (bunker fuels)</li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>For 2030: see page 27 of the document</b></li> <li>• <b>Note for 2040 and 2050:</b> <i>Data gathered from JRC Technical Report (2022) "The role of hydrogen in energy decarbonisation scenarios: Views on 2030 and 2050". For more information, see section "Scenario selection" (page 10-11) &amp; Figure 26 (page 31) of the report <a href="#">here</a>.</i></li> </ul>
REPowerEU	European	2022	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b> <u>Includes:</u> Iron &amp; steel; Ammonia for fertilizers; Refining; Industrial heat.</li> <li>• <b>Transport: Yes.</b> <u>Includes:</u> Road transport (Transport); Aviation (synthetic fuels); Maritime (bunker fuels)</li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>See page 27 of the document</b></li> <li>• REPowerEU allocates 4 Mt (133 TWh) of hydrogen demand in the form of ammonia (or other hydrogen derivatives) import, without specifying in which sectorial application this hydrogen could be used. It is therefore assumed that the 4 Mt are evenly split in the 4 demand categories (resulting in an additional 1 Mt, or 33 TWh, for industry, transport, power and buildings.</li> </ul>
A Clean Planet For All	European Commission	2018	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Key assumptions and narrative available pages 56 and 324-326 of the document.</b></li> <li>• <u>Note:</u> <i>Data gathered from European Commission Report (2018) "A Clean Planet for all". For more information, see Figure 32 (page 30) of the report <a href="#">here</a>.</i></li> </ul>
Impact assessment SWD 176 - MIX	European Commission	2020	<a href="#">Click here</a>	<ul style="list-style-type: none"> <li>• <b>Industry: Yes.</b></li> <li>• <b>Transport: Yes.</b></li> <li>• <b>Power sector: Yes.</b></li> <li>• <b>Buildings: Yes.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Note:</u> <i>Data gathered from aggregation and consolidation effort performed in Guidehouse (2021)'s analysis. For more information, see Figure 21 (page 52) of the report <a href="#">here</a>.</i></li> </ul>