

Comment	How we addressed comment/notes
well, which concern mainly how you deal with “general sustainability”. Sustainability is important and its assessment should be based where possible on solid and unbiased metrics for direct and indirect environmental impacts (for the various factors on an LCA basis assessment per unit of energy produced?).]	For the study, broader sustainability is defined as “Broader sustainability considers the wider aspects of the SDGs, where non-compliance is viewed as a risk. For example, social (e.g. poor working conditions) or environmental conditions (e.g. threats to local water/food availability, biodiversity impacts, pollution) may pose a risk to the ability of clean energy technology value chains to provide energy security, for instance because of increasingly stricter legal requirements (compliance with which is assumed) or public opposition by EU citizens.”. This is intended to avoid overlap with circularity which is also
Results not always easy to digest. On the other side the executive summary and proposed R&I action plan are currently still a bit vague. We should discuss how to best exploit the study content communication-wise.	policy brief (RTD format); revised infographic; moving some criticalities shortlisting info to value chain chapter; Incorporating additional description/explanation of the R&I challenges not included in final shortlist
what happens with the scoring approach (table A.5) in the main report	elaboration of the shortlisting and longlisting methodology as discussed. Under Task 3, renamed Table 5.1 as I added the matrix under task 2.
It is also suggested to consider to bring some of the longlisted criticalities and actions from the annex into the main text, in particular for those areas, where obvious options are not followed up (in particular annex F).	Added some detail on the actions not prioritised to section 9.1, main report.
Also, regarding the key criticalities and the R&I action plan there should be a more detailed analysis and detailed action plan proposed. It is important to verify also the compliance with the minimum number of actions foreseen in the ToR (we need 30 R&I actions in the action plan [as discussed we need to check content in respect of ToR]). The R&I actions proposed in the action plan should be expanded in length and context	moving some criticalities shortlisting info to value chain chapter; Incorporating some of the R&I challenges not included
Also we miss a final discussion and sensitivity analysis, like: Are the results obtained with the methodology expected? Will the scenarios, even if they will not materialise 1 to 1 be robust enough to represent a large share of future possible developments?	Amended in section 6. Also added a point on scenario coverage in the discussion
This might in particular also be relevant for CCUS, as it is presented as a critical value chain for RFNBO’s as well. There are currently no proposed R&I actions on CCUS (p.286-287). Perhaps this should also be addressed?	Amended - There is one RFNBO/CCU action (action 10) which was previously only labelled as RFNBO - have amended and clarified the action to highlight DAC. A clarification was added to the conclusions on this point, too.
For CCUS: The Industrial Carbon Management Strategy and the 2040 climate targets are both being published by now. If possible, the study should update the relevant sections with this new information (especially chapter 8.1 CCUS).	Section 8.10 (CCU SWOT) updated with updated reference to ICM strategy (also in introduction). 2040 climate target added to introduction.
There is the impression that some technologies were developed more in depth than others even they are at comparable TRL(e.g. ocean vs solar fuels) this should be better rationalised.	Level of detail not always available. Lots of info on ocean energy and less so on solar fuels (info is about solar energy in general, not specific to solar fuels) so SWOT analysis is challenging. Same issue with anything revolving around cyber/digital vulnerability : this info is not readily available so while we conducted thorough desk research, much of the info was confidential/not accessible.
The study should use EUR as currency. Where foreign currency is needed (e.g.US investment plan in USD, please add EUR in brackets).	Amended. To pick up additional inconsistencies during copy editing.
Regarding the international coverage, we miss looking at India and Brazil as important players.	References exist in (and additional ones added) SWOT based on background from the R&I landscape analysis and supplementary desk research: hydropower, batteries, pv, hydrogen, smart grids, wind, biofuels. References added to R&I action plan (section 10.2)
Why CHN is used for China abbreviation and not CN?	to pick up during copy editing
Regarding the SWOT analyses (e.g. advanced biofuels) correct reference to funding programmes should be verified and coverage of the SET Plan (IWGs) is required.	Added relevant Horizon Europe calls from latest WP (section 8.1, advanced biofuels reference 64; section 8.2, bioenergy reference 79). Added reference to SET Plan IWG 8
<i>The ETIP itself has no funding programme, check also the SET Plan IWG 8</i>	position paper on advanced biofuels/feedstock (in swot table). Corrected wording on ETIP incorporated
PV: we attach you recent study results important for the supply chain analysis (Alex can provide further details	

Acronym	Definition
PFAS	Perfluoroalkyl substances
PTFE	Polytetrafluoroethylene
AEM	Anion exchange membranes
PEM	Proton-exchange membrane
R&I	Research and Innovation
TOR	Terms of reference
ACT	Advanced control technologies
TES	Thermal energy storage
UTES	Undergrounds thermal energy storage
CHP	Combined heat and power
CAES	Compressed air energy storage
LCOE	Levelised cost of electricity
MS	Member State
DG RTD	Directorate General Research and Innovation
ACT	Associated Country
HVDC	High-voltage direct current
HVAC	Heating, ventilation, and air conditioning
ETIP	European Technology & Innovation Platform
JU	Joint Undertaking
S-T	Strength-Threat
S-O	Strength-Opportunity
W-T	Weakness-Threat
W-O	Weakness-Opportunity
SWOT	Strength, Weakness, Opportunity, Threat analysis
IRA	Inflation Reduction Act
Mtoe	Million tonnes of oil equivalent
RD&D	Research, development and demonstration
SET Plan	Strategic Energy Technology Plan
CCUS	Carbon capture, utilisation and storage
CCS	Carbon capture and storage
PV	Photovoltaics
RFNBOs	Renewable fuels of non-biological origin
TRL	Technology readiness level
TCP	Technology Collaboration Programme
RED	Renewable Energy Directive
RAG	Red-Amber-Green rating
SDGs	Sustainable Development Goals
EU	European Union
GHG	Greenhouse Gas
DAC	Direct Air Capture
CO ₂	Carbon Dioxide
TFEU	Treaty on the Functioning of the European Union
IEA	International Energy Agency
CETO	Clean Energy Technology Observatory
PESTLE	Political (P), Economic (E), Social (S), Technological (T), Legal (L), and Environmental (E) analysis
LCoH	Levelised cost of heating