IEA Bioenergy
Technology Collaboration Programme

Assessment framework

IEA Bioenergy inter-task project (ITP) ‘Synergies of green hydrogen and bio-based value chains deployment’

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Task of the assessment framework (WP1)

1. Scoping of the case studies (support the selection of the case studies)
2. Defining reference system, timeframe and boundaries
3. Providing a set of indicators (Key Performance Indicators - KPIs) for different categories for describing and evaluating the different case studies. Thereby acknowleding their different nature.

>> These activities go hand in hand

>> WP1 supports the creation of the case study templates (WP2 & WP3)

>> Close exchange with WP4 and WP5 on indicators and system boundaries

>> Vienna workshop 19/10/22 for kick-off discussion

1. Scoping of the case studies

Discussion and work so far…

- What is the scope of the value chain (upstream – downstream)
- Which information of the value chain is important for presenting the case studies

Output:

Task/ contact	Project/ company	Country	Technology	TRL				Indication on commercial availability of the technology TRL9			Feedstock	Products/ by-products (energy, materials), pls name	Technical data available (Y/N)	Economic data available (Y/N)	Environ-mental data available (Y/N)		specific comments related to the technology to outline advantages (e.g. hard-to-abate sectors), pls name	other system services (inte-gration of VRE, CCS, CCU, etc.), pls name
				1-3	4-5	6-7	8-9	today	2030	2050					carbon foot-print	other LCA data		

2. Reference system, timeframe and boundaries

Discussion and work so far…

Boundaries:

- Foucs on case studies as actual projects/companies (no modelling)
- Contacts via IEA Bioenergy Tasks members

Timeframe:

- Presenting status quo and the future
- Need for two timefreames, 2030 and 2050

Reference system:

- Challenge >> addressing changing reference systems due to market evolution
- Need for two different reference systems for the years 2030 and 2050 (which comparable renewable (hydrogen) production technology will be prominent in 2030 and 2050 respectively, e.g. renewable hydrogen reference system based on wind and solar or biomethane)
- IAMs can support this discussion. Use of storylines and back-casting.

3. Indicators

Discussion and work so far…

- Indicators (also referred to as KPIs)
  - Technical
  - Economic
  - System
  - Environmental >> dedicated work package 5
- Can build on existing KPI thinking for bioenergy technologies.
- Data availability: Economic KPIs will be a challenge for emerging technologies.
- For commercial technologies presumably companies can provide costs. We can also make own calculations if enough data is available.
- Different requirements for assessment WP2 & WP3 case studies

3. Indicators: initial considerations

Economic

1. Investment need
2. Operating costs
3. CO_2 abatement cost
4. …

Technical

1. Yields (e.g. for kg H_2 per tonne of dry feedstock)
2. CO_2 sequestration potential per kg of hydrogen produced
3. Energy/H2 efficiency
4. …

System

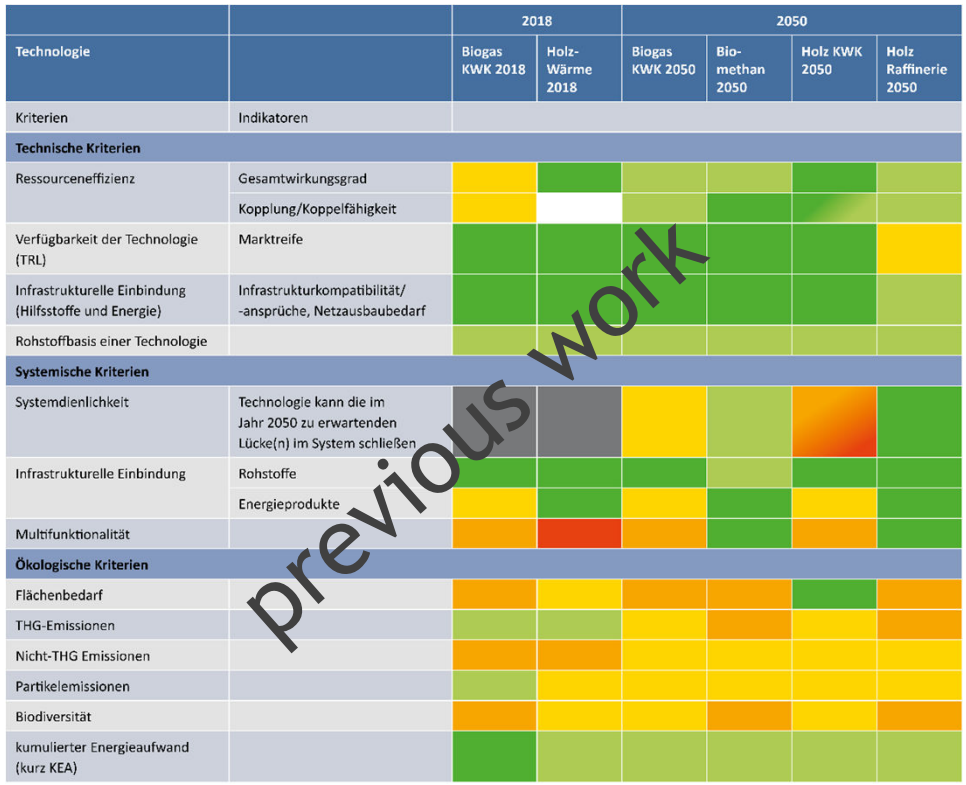
1. Infrastucture development need
2. Energy system services (CCU, CCS etc.)
3. Hard-to-abate sectors
4. Multiple products (energy, materials)
5. …

Environmental

discussion on indicators and assessment part of WP5. presented in the next session.

3. Indicators: initial considerations (ctd)

- A traffic light system could be one solution to summarize all cases.
- Examples and expertise from other projects is available.
- The idea is to apply and further develop the available assessment frameworks to the project needs (adding the H_2-link, timeframe etc.)



		2018		2050			
Technologie		Biogas KWK 2018	Holz-Wärme 2018	Biogas KWK 2050	Bio-methan 2050	Holz KWK 2050	Holz Raffinerie 2050
Kriterien	Indikatoren						
Technische Kriterien							
Ressourceneffizienz	Gesamtwirkungsgrad						
	Kopplung/Koppelfähigkeit						
Verfügbarkeit der Technologie (TRL)	Marktreife						
Infrastrukturelle Einbindung (Hilfsstoffe und Energie)	Infrastrukturkompatibilität/ -ansprüche, Netzausbaubedarf						
Rohstoffbasis einer Technologie							
Systemische Kriterien							
Systemdienlichkeit	Technologie kann die im Jahr 2050 zu erwartenden Lücke(n) im System schließen						
Infrastrukturelle Einbindung	Rohstoffe						
	Energieprodukte						
Multifunktionalität							
Ökologische Kriterien							
Flächenbedarf							
THG-Emissionen							
Nicht-THG Emissionen							
Partikelemissionen							
Biodiversität							
kumulierter Energieaufwand (kurz KEA)							

compare: acatech/Leopoldina/Akademienunion (2019): Biomass: striking a balance between energy and climate policies. Strategies for sustainable bioenergy use.

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