



**CO<sub>2</sub> VALUE**  
**EUROPE**

# **Innovation Fund**

# **CCU-sector workshop**

**DG CLIMA Questionnaire discussion**

**19<sup>th</sup> September 2019, Brussels**

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# General information

- 16 responses received
- 1<sup>st</sup> step: compilation (word document) sent to DG CLIMA
- 2<sup>nd</sup> step: this presentation as basis for today's discussion
  - Concise basis for discussion;
  - Only key messages;
- 3<sup>rd</sup> step: individual questionnaires to be sent to DG CLIMA for follow-up
- *Suggested format for discussion (5 criteria, milestones, PDA, sharing)*
  - *Presentation of key findings*
  - *Response from DG CLIMA and discussion*



## Criterion 1 - Effectiveness of GHG avoidance potential, where applicable compared to EU ETS benchmarks

**Q1. Will the existing MRV (monitoring/reporting/verification) requirements be applicable to innovative plants in your sector?**

Representative answer(s) :

- Yes (PtL, WtE, CO2 to building material, Waste to materials)
- No (WtE, PtL, Biomass to power, Infrastructure)
- CCU plants could also meet MRV requirements so that monitoring is transparent and consistent

Comment

Possible misinterpretation: Adaptability of existing MRV to CCU plant vs. applicability of the CCU plant to the ETS scheme.



## Criterion 1 - Effectiveness of GHG avoidance potential, where applicable compared to EU ETS benchmarks

**Q2. If not, what further guidance needs to be prepared for a fair evaluation of the GHG emission reduction potentials of different projects in your sector?**

Representative answer(s) :

- Consistency across sectors
- Definitions of benchmarks
- Scientifically correct LCA methodologies
- Avoid carbon leakage (to other countries or industries)
- Including GHG emissions out of the ETS scope



## Criterion 1 - Effectiveness of GHG avoidance potential, where applicable compared to EU ETS benchmarks

### Q3. Which role do you see for life-cycle assessment (LCA) in calculating and verifying the GHG emission avoidance potential?

#### Representative answer(s) :

- Fundamental for including all GHG emissions along the chain
- Crucial for verifying GHG avoidance and measuring sustainability
- Basis for evaluation, ranking, funding if applied consistently
- Needs to be applied together with LCC (Life Cycle Costing)



## Criterion 1 - Effectiveness of GHG avoidance potential, where applicable compared to EU ETS benchmarks

### Q4. What are the critical points that need to be considered when undertaking an LCA for projects in your sector?

#### Representative answer(s) :

- Determine functional unit, consistent system boundaries and allocation methods
- Scope 1-3 emissions, cradle-to-grave
- Compare products of equal function
- Electricity from mixed energy sources // Include waste heat recovery
- Apply future GHG intensities
- Include further environmental benefits



## Criterion 2 - Degree of innovation compared to the state of the art

**Q1. How can the degree of innovation in comparison to the state-of-the art be best evaluated considering that innovation may relate to a specific technology, processes or their combination, products and services?**

Representative answer(s) :

- Technologies (& their integration) proven or not // Product (& their application) known or not
- Usability of existing infrastructure
- Use of renewable energy // GHG emission reduction // long-term solution
- Industrial symbiosis potential and local circularity
  
- Innovation degree not the most important; focus on tons of CO<sub>2</sub> avoided, costs and replicability



## Criterion 3 - Project Maturity in terms of planning, business model, financial and legal structure and reaching financial closure within 4 years

### Q1. Which criteria should be used to evaluate project maturity?

#### Representative answer(s) :

- **Technical:** validation of previous TRL // Existing infrastructure use // scalability and replicability // FEED (incl. LCA) ....
- **Economic:** business plan & financial structure // asset operation beyond project // stakeholder analysis // commitment of investors, contractors // off take agreements ...
- **Other:** social acceptance // legal structure // environmental impact // permitting status
  
- Commitment of private investors decreases as risk increases → not suitable criterion
- Social acceptance varies easily → not suitable criterion



## Criterion 3 - Project Maturity in terms of planning, business model, financial and legal structure and reaching financial closure within 4 years

### Q2. What essential elements should be in place? Concluded feasibility studies, FEED, or other?

#### Representative answer(s) :

- The conclusion of FEED should have the highest weight;
  - Concluded feasibility study and validation of the technology;
  - Location including suitable traffic connection, utilities supply;
  - Off taker and feedstock supplier agreements;
  - Governmental support
- 
- FEED should not be in place. Technology should be at FEED readiness stage;



## Criterion 4 - Scalability: technical and market potential for widespread application or replication or for future cost reductions

**Q1. Should projects indicate their potential market (volume and expected price developments) and cost reduction potentials? At national, European or global level?**

Representative answer(s) :

- Yes
  - Depending on product: at national, European or global level
  - Verifiable data and justified assumptions
  - Provide forecasts even if there is inherent uncertainty
  - Not for the product but for the innovative concept
  
- No
  - Market under development → assumptions have low added value



## Criterion 4 - Scalability: technical and market potential for widespread application or replication or for future cost reductions

**Q2. Or should this be determined by market statistics and studies? What are the most reliable sources for your sector?**

Representative answer(s) :

- Market statistics not meaningful at this stage
- Independent evaluation of the projections compared to market statistics
  
- Reliable sources: Market analysis reports via trade associations and banks // National and EU statistics (energy and raw materials) // Off take agreements and industrial demand ...



## Criterion 5 - Cost efficiency (€/ton of net CO<sub>2</sub> avoided): relevant cost minus contribution by project proponent divided by total performance over 10 years

**Q1. Are there any specific issues that sector projects may face with the application of the definition of relevant cost from the Regulation?**

Representative answer(s) :

- **Definition of “relevant costs” is unclear**
- Costs at 10 years time or average over 10 years ?
- Consider the time scales of utilisation (permanent vs. temporary).
- Compare projects leading to products of equal function (e.g. PtL to PtL)
- How to account for learning curve?
- Consideration of novel technologies that might face high costs but hold future potential for emission reduction



## Criterion 5 - Cost efficiency (€/ton of net CO<sub>2</sub> avoided): relevant cost minus contribution by project proponent divided by total performance over 10 years

**Q2. Are the conventional production costs easy to estimate with confidence? If not, can price of conventional product be used as a comparator ?**

Representative answer(s) :

- Yes, but still necessary to test assumptions
- Market prices more transparent than production costs
- Feedstock prices volatile, so market prices to be treated with caution
  
- Inaccurate to compare the cost of a demonstrator of a new technology with the cost of conventional industrial scale technology (consider 'learning curve').



## Criterion 5 - Cost efficiency (€/ton of net CO<sub>2</sub> avoided): relevant cost minus contribution by project proponent divided by total performance over 10 years

### Q3. What are the key variable factors determining the financial gap?

#### Representative answer(s) :

- Efficiency of taking fossil CO<sub>2</sub> out of the value chain;
- Access to CO<sub>2</sub>, utilities, and usability of existing infrastructure for transport and distribution
- Economies of scale // learning curve
- (Green) energy costs // Crude oil price // CO<sub>2</sub> price // Product offtake price;
- Regulatory aspects (subsidies, taxing of conventional product, tax reduction for CO<sub>2</sub> free products);
- Risk margin, CAPEX and timeline due to FOAK



## Criterion 5 - Cost efficiency (€/ton of net CO<sub>2</sub> avoided): relevant cost minus contribution by project proponent divided by total performance over 10 years

**Q4. What are the financial risks and how best can they be evaluated?** *(strongly linked to Q3)*

Representative answer(s) :

- Getting permit → need for legislation giving priority to innovative processes
- If regulatory mechanism is stable & simple, development till financial close is daily business
- Commitment for sustained supply of renewable energy and CO<sub>2</sub> and off take of product
- Price fluctuations of inputs
- Long period of realizing a project // cost overruns & delays

## **Q1. What is the expected time to financial close and entry into operation for innovative projects in your sector?**

### Representative answer(s) :

- Financial close: 9 months - 4 years
- Entry into operation: 2- 4 years
  
- Dependent on: permit period // acquiring subsidies or grants // contracts with off-takers and CAPEX suppliers // duration of tendering procedures ...

**Q2. What are the key milestones before financial close, e.g. feasibility or FEED study, permitting, State-Aid approval, etc. and before full entry into operation, e.g. how long are the construction, testing and commissioning periods?**

Example of a single answer:

- **Before financial closure:** Site selection // Agreements on conditions and volumes of feedstock suppliers and off takers of products // Contracting (utilities , land) // Business plan // Permit // Seveso study // Successful demonstration on a scale of 1 t/h input // Clarity on subsidies // IP due diligence // FEED (incl. LCA) // EPC offer // State aid approval
- **Before operation:** Standard project execution milestones for plant construction & commissioning (civil work, erection, integration, mechanical completion, commissioning, performance test): up to 2 years

**Q3. How should the grant be optimally disbursed over the project life cycle? To what milestones can/should disbursements be linked?** *(strongly linked to Q2)*

Example of a single answer

- Start of project // FEED study, 5% // financial close incl. permits, 35% // detailed engineering closed, 15% // completion of erection, 20% // start of operation, 5% // operation and reporting period, 20%
- Grant for feasibility and FEED should be limited
- Disbursement contingent of completing the FEED and demonstrated commitment of some commercial finance.



## Project Development Assistance

### Q1. Will PDA be useful for projects in the sector? If yes, what types of assistance?

Representative answer(s) :

- Yes
  - Project monitoring & documentation
  - Support for feasibility, FEED and detailed engineering
  - Regulatory support
  - Access to expert network
  - Financial support for permitting
  
  - Eligibility criteria for PDA?



## Project Development Assistance

**Q2. Should there be maximum € amounts for different types of PDA and what would these levels be?**

Representative answer(s) :

- Yes
  - 10-50% // 2,5-3 M€
  - Limited to safeguard funding to the project itself
- No
  - Project dependent
  - Sufficient but not capped



## Project Development Assistance

**Q3. Should projects be required to publish the results of any studies done with PDA, if they decide not to apply for Innovation Fund full support or are discontinued?**

Representative answer(s) :

- Yes
  - The results of any publicly funded study should be made available to the public.
  - One can learn from the reasons why these projects are abandoned, without much harm to IP
- No
  - Only if support has been granted
  - Might reduce interest to proceed
  - Business sensitive information



### Q4. Should FEED be financed by PDA or only after successful application for an Innovation Fund award?

Representative answer(s) :

- Yes
  - Always, independently of the follow-up
  - Before IF award, otherwise high risk for IF that not enough high-quality projects will be raised.
  - Will enable projects to secure contractors and funding for the EPC phase
  - After successful application
- No
  - FEED will be done anyhow by the industry before applying for funding



## On knowledge-sharing requirements

### **Q1. What type of technical, economic, project management, regulatory and permitting information should be shared?**

#### Representative answer(s) :

- Certification of GHG emission reduction and usage of renewable resources
- Technical non-proprietary details
- Market conditions & barriers // Regulatory and permitting information
- Quality standards for products
- Overall CAPEX, capacity, overall production cost and CO2 abatement potential.
- Hurdles during project execution



## On knowledge-sharing requirements

**Q2. What types of knowledge-sharing activities should the implementing body organize and for the general public?**

**Q3. What should be the form of knowledge sharing tools that would be useful for the market**

Representative answer(s) :

- Conferences, workshops, seminars, innovation days, networking events → role of sector associations
- Site visits, media events.
- Collective web page with links to projects, contacts, publications, best practice reports, milestones reached, Q&A/FAQ for the public...
- Open dialogue with the general public through public seminars



## On knowledge-sharing requirements

### **Q4. How can synergies be obtained from linking to other programmes and networks?**

#### Representative answer(s) :

- Workshops on the most important themes in the energy transition
- Through EU sector associations // technology platforms // global institutions
- Database of programmes & projects running



## Some general questions

- **Weight of criteria ?**
- **“Simplified application procedure” for small scale projects ?**



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