Enabling the H_2-CCS value chain: Business models, risk mitigation, incentives and legal frameworks.

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Work Package 3

UiO : Faculty of Law
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Outline

1. New opportunities for CCS and green finance
2. Designing business models for the whole H_2-CCS value chain
3. Starting point: risk taxonomy.
   - Including regulatory and legal risks.
4. Developing a mitigation strategy and instrument choice.
   - The role of legal frameworks.

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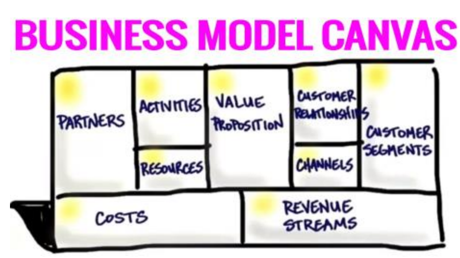
1. Second generation of *green finance* instruments

- Do not need to re-invent the wheel, but need to learn lessons (from failures, other sectors) and adapt the solutions.
- 1st generation of de-risking in the 1990s/2000s: who should bear the burdern of environmental damages? How to value the environment? Are banks co-responsible with polluters?
- Since UNFCCC, Kyoto Protocol and Paris Agreement: climate mitigation (and adaptation) put on the agenda. New regime for climate financing.
- CCS: After 1st attempts, 2nd window of opportunity for CCS, building bridges with other energy carriers.
- May not be a 3rd chance, and there is a sense of urgency (5th AR IPCC report).

2. Designing business models…

- Business model = refera to how a business seeks to create and deliver value.
- H_2-CCS technologies can create value in a number of ways.
- However, incentives are per today absent or insufficient to enable the creation of such values.
- Need to align commercial interests across the entire CCS chain in combination with H2.



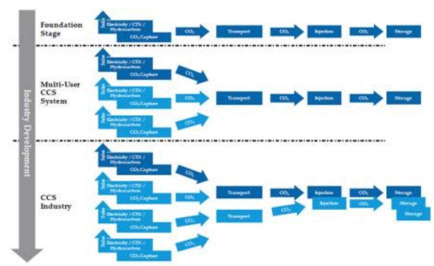
… which work along the value chain.

- Interlinked activities, with a variety of actors.
- All links of the **value chain** matter.
  - Should mitigation strategies reflect risks along the whole chain?

- Different degrees of risks, different risk types.
  - Different risks = different mitigation tools

- Different degrees of maturity for the chain:
  - No market
  - Early markets
  - Liberalised market

- So, one or several business models ?



With a diversity of actors along the chain

- Local, national, regional, European and international actors.

- Both big projects/ large scale (stock market) and retail (local markets, local jobb creation, sutainability of the territories) (not stock market).

  - Established companies can more easily access the debt and equity markets, which is less the case for smaller or newer companies.
  - A diversity which must be taken into account and preserved.

- Producers
- Consumers
- Suppliers
- Emitters
- Infrastructures operators
- Storage site operators
- State
- Regulator
- Tax payers

3. Starting point: risk taxonomy

The first instrument of de-risking will consist in categorizing the different risks, ie establishing the **taxonomy of risks** (cf. Deliverable D.3.3.1., Risk Matrix).

- necessary to clarify where the needs are in the context of the H_2-CCS value chain. Which costs will be the highest in H_2-CCS projects?
- NB: risks can be negative (threat) but also positive (opportunity).

External risks:

- Financial Market Risk
- Political and Regulatory Risk
- Macro-economic Risk
- Environmental Risk
- Acceptance risk

Internal risks:

- Operational Risk
- Strategic Risk, relating to the strategic decisions
- Reputational Risk
- Technical risk

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Classification of risks, incl. investment risks. Ex.:

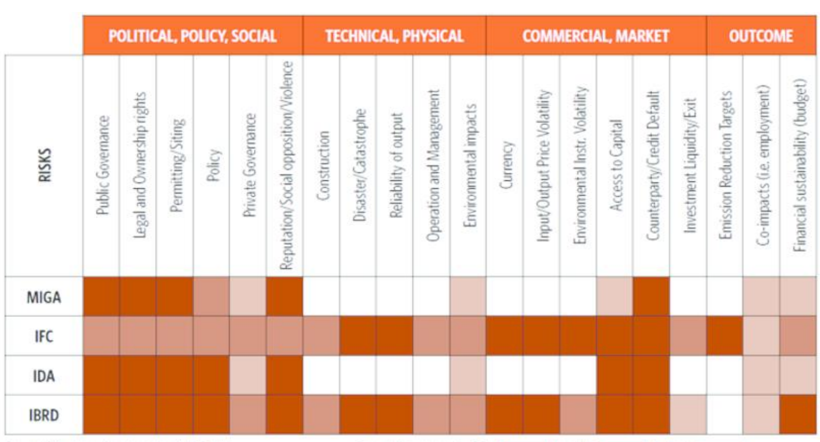

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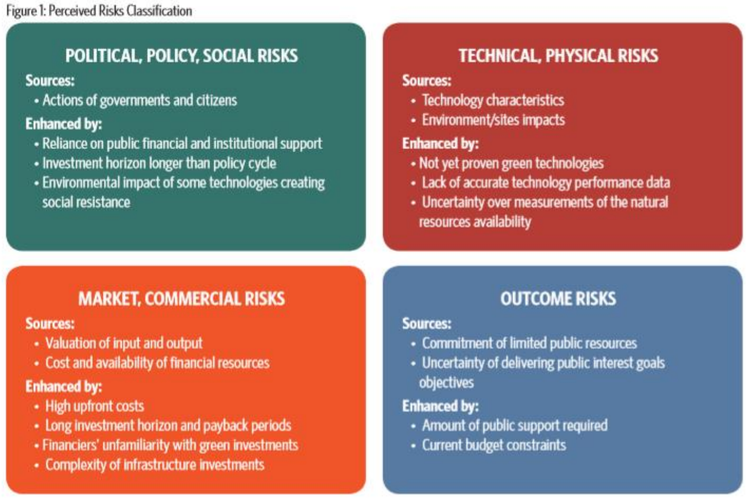
Figure 1: Perceived Risks Classification



Source: Climate Policy Initiative, 2013

Among them: *regulatory risks* due to ongoing processes

Of relevance for ELEGANCY:

- Detailed rules for the implementation of the Paris Agreement (The Rulebook) and the different carbon mechanisms defined in it (Art. 6) by 2020.
- EU: “Clean Energy Package for All Europeans”-legislative package
- Review CCS Directive. Focus on transport and permanent storage.
- Different national strategies and priorities, and CCS policies. Changes in law.
- Brexit

See mapping exercise in Deliverables D.3.1.1 and D. 3.2.1.

Other *traditional legal risks* beyond regulatory uncertainty:

- **Compliance risk**
  - Potential for fines and penalties in case of non-compliance with laws and regulations.
- **Contract risk**
  - If a partner, customer or supplier fail to meet the terms of the contract, resulting in losses. Or from own failure.
- **Non-contractual rights and obligations**
  - A third party infringing on non-contractual obligations. Eg: a competitor infringes your patents. Or you infringe a third party's rights.
- **Legal dispute risk**
- **Choice of law**
  - Common law vs. civil law
- **Reputational risk**
  - Due to legal actions, sanctions imposed by regulators.

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4. Developing a mitigation strategy

The example of the renewables sector.

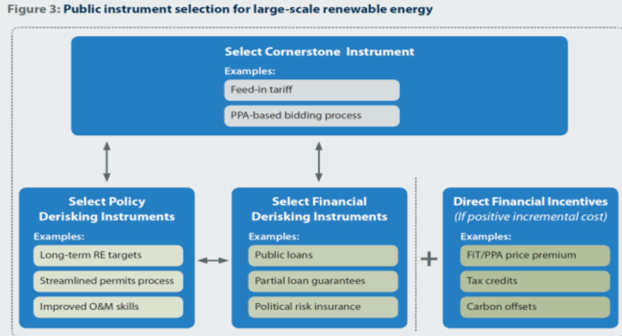

Figure 3: **Public instrument selection for large-scale renewable energy**

Source: Glemarec (2011), adapted.

The challenge =

- to design packages of public instruments which can cost-effectively catalyse private investments.
- policy trade-off between de-risking and direct incentives.

Final objective = to find the right instruments mix.

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(i) Financial de-risking instruments

- Do not seek to directly address the underlying barrier; but
- Aim to transfer investment risks to private and/or public actors.

Examples:
- Public-private partnership
- Public guarantee fund
- Green loans / Public loans
- Insurance
- Direct investments

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(ii) Direct and indirect public financial incentives

- **Direct financial incentives**
  - Feed-in tariffs
  - Price premium
  - PPA
  - Carbon offsets
  - Public procurement

- **Indirect public financing**
  - Guarantees of origin
  - Carbon pricing
  - ETS

- **Fiscal incentives, tax credits**
  - Investment or production tax credits
  - Capital subsidy, rebate: reductions in energy, CO2-taxes, VAT or other taxtes

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Some upcoming regulatory challenges:

- **Technology neutrality** as the standard requirement under common schemes.
- Changing parameter for clean energy technologies: the **progressive removal of financial incentives** in the form of subsidies / state aids (zero subsidy environment).
  - Lobby to keep support for emerging technologies.
- In this new context, **financial innovation** will be key to unlock the potential, in particular in technologies such as H_2-CCS, at the hedge of two sectors.

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(iii) Regulatory and legal de-risking measures

Policy de-risking instruments

- **Definition policy de-risking instruments :** target the root causes of investment risk. Relies on regulatory measures to mitigate risk. Government policies can help de-risk projects and lower the cost of capital.

Examples:

- More efficient permitting procedures (including exceptions or simplifications)
  - Streamlined permits process: for installation, grid connection, etc.
- Definition of targets:
  - Emissions targets
  - Hydrogen targets
- Definition of plant requirements and standards:
  - Capture ready
  - Fuel quality requirements (FQD) – life-cycle approach
  - Use of biomass (CH), negative emissions
  - Fuel blending standards
- Priority grid access
- Political risk insurance

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Sharing / balancing risks through legal instruments

- **Through legislation**
  - Storage liability
  - Quotas
  - Etc.

- **Through contract**
  - Passing on the risk: designing attractive value sharing arrangements;
    - Could reflect risks at other levels of the value chain (eg: capture, treatment, CO2 storage);
    - Or not: but then need for specific instruments for those risks.
  - Standardisation
    - See standard contractual mitigation measures used in Large Infrastructure Agreements

- NB: difference in legal traditions between Common Law and Civil Law within the ELEGANCY-project.

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Conclusion

- Objective: **enabling the H_2-CCS value chain**.
- The role of H_2 in de-risking CCS as well as developing the H_2 market, alone or in combination with other markets (power-to-gas, etc.).
- The need for de-risking by mitigation AND incentivising at the same time.
- Economic support, but not only. Regulatory frameworks as incentives.
  - The role of law in de-risking and incentivising.
  - See the models provided by ELEGANCY project.

= New business models.

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