Institute for Studies and Power Engineering

CCS DEPLOYMENT IN EU

CO_2 TRANSPORT INFRASTRUCTURE

CHALLENGES & BARRIERS

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CCS DEMO Four Challenges (1)

I. TECHNICAL/INDUSTRIAL

- Uncertainities around CCS technologies (performances, operation, large scale up, etc.)
- Potential bottleneck of CCS equipment for industrial ramp up
- Cost and energy penalty
- Knowledge sharing in a competitive environment

II. FINANCIAL

- Uncertainty/ lack of funding (EU, Member States, etc)
- Uncertainties around cost of CCS technologies, revenues and incentives
- Funding streams not in line with cost spending for CCS
- Development of new insurance tools

CCS DEMO Four Challenges (2)

III. REGULATORY

- Lack of regulation framework for permitting (especially storage)
- Need for long – term CO_2 regulation at national, regional and international level
- Lack of clarity on future role of coal

IV. PUBLIC SUPPORT

- Lack of awareness of CCS among general public
- Risk of ”not in my back yard” not only for CCS, for all industrial assests

BARRIERS

- **Directive CCS**

  - 25th of June, 2011 - only implemented by Spain
  - July 2012 – transposed in all MS with EEPR and NER300 projects

- **Price of EUA:**

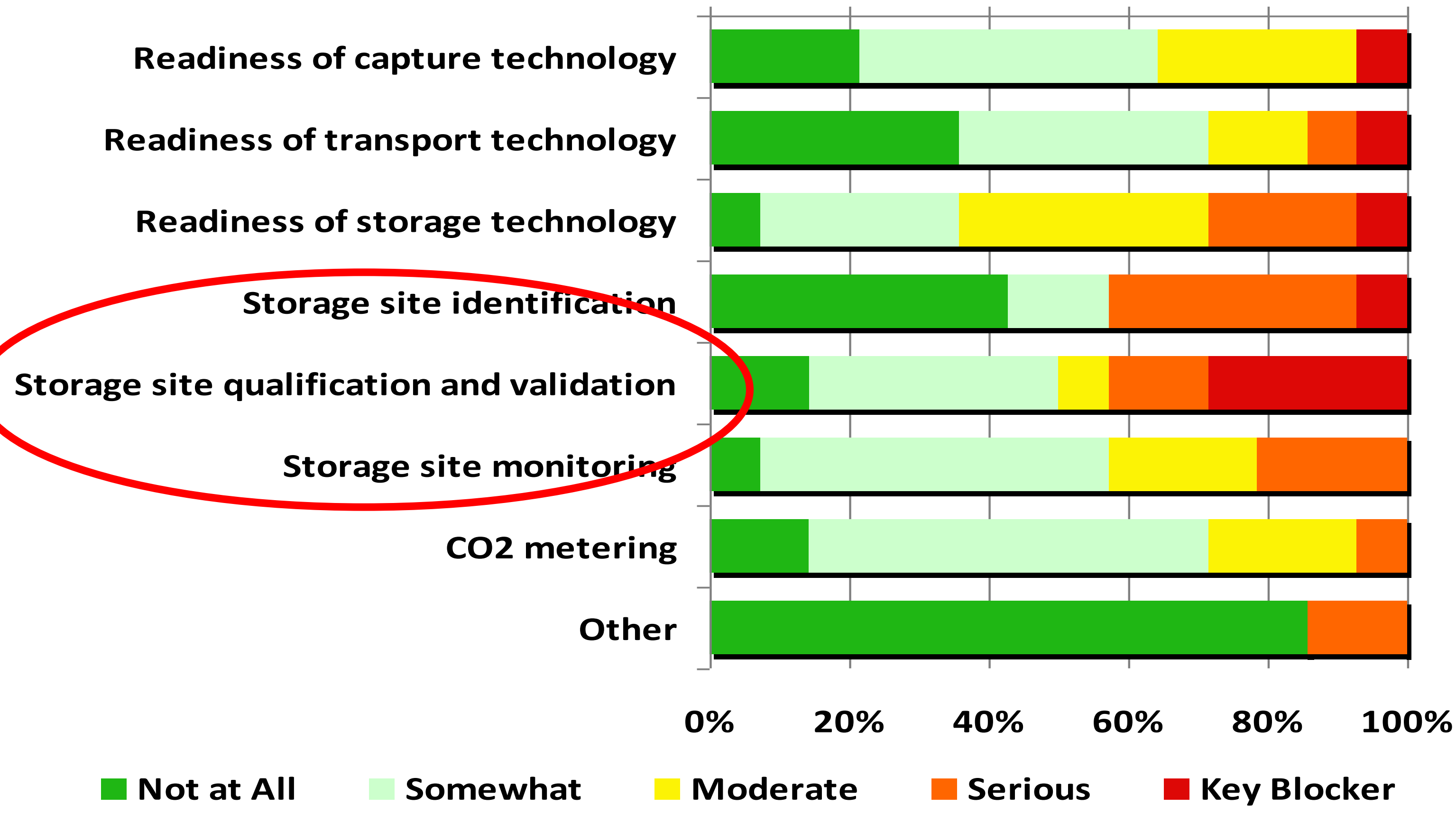
  - 2008 25 €/t CO_2 expectation for further rise
  - 2012 7÷ 8 €/t CO_2

- **EU infrastructure for CO_2 transport and storage**

CCS Demonstration Projects 2012

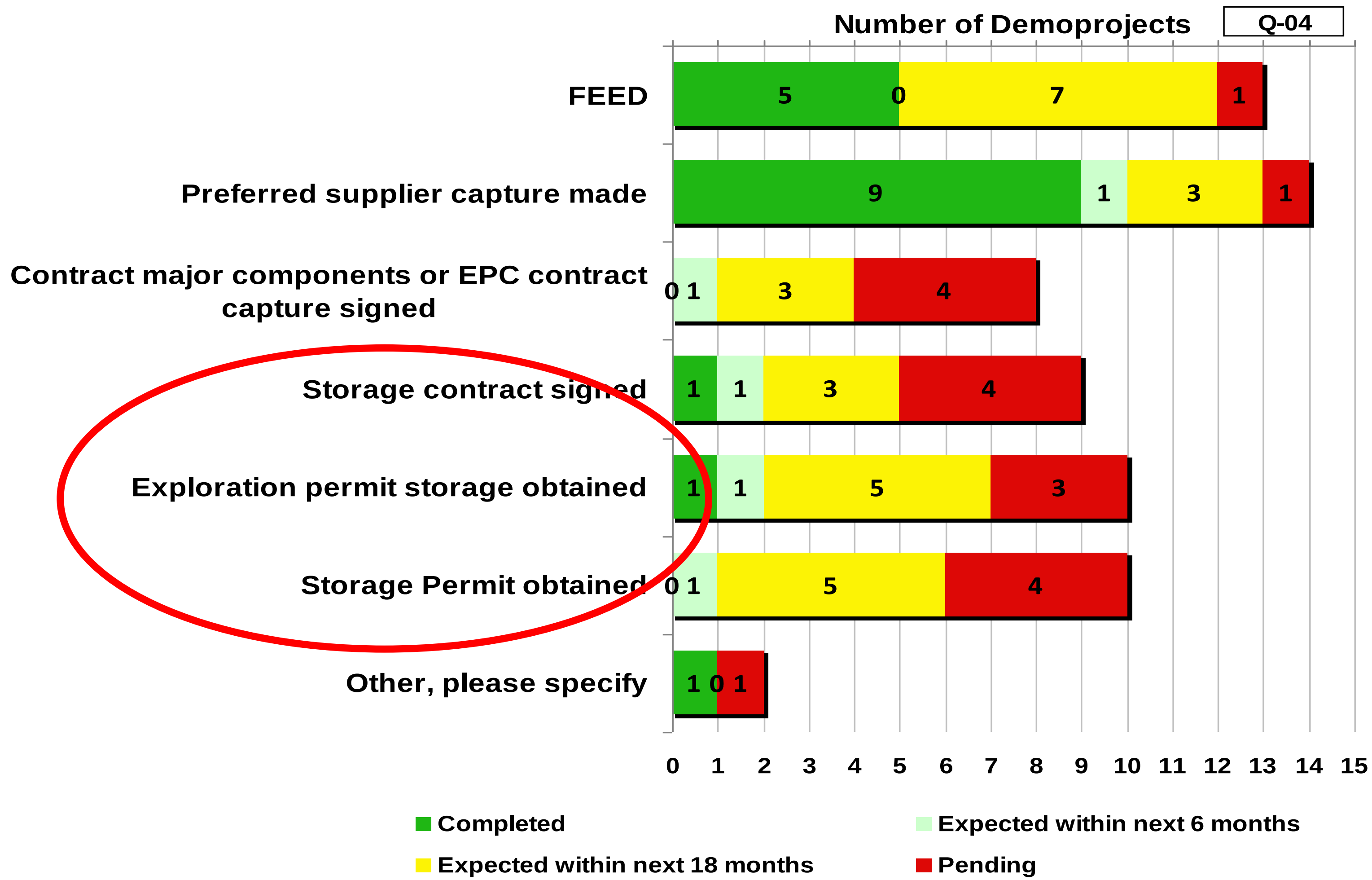
- **Belchatow** (PL)
- **Compostilla** (ES)
- **Don Valley** (UK)
- **Drax** (UK)
- **Eston Grange (**UK)
- **Florange/Ulcos-BF**(FR)
- **Hunterston** (UK)
- **Jaenschwalde** (DE)
- **Killingholme** (UK)
- **Longannet** (UK)
- **Peterhead** (UK)
- **Porto Tolle** (IT)
- **Rotterdam/Green Hydrogen**(NL)
- **Rotterdam/ROAD** (NL)
- **Turceni/Getica** (RO)

ZEP Report
Challenges and Blockers on the way to FID
Technical issues

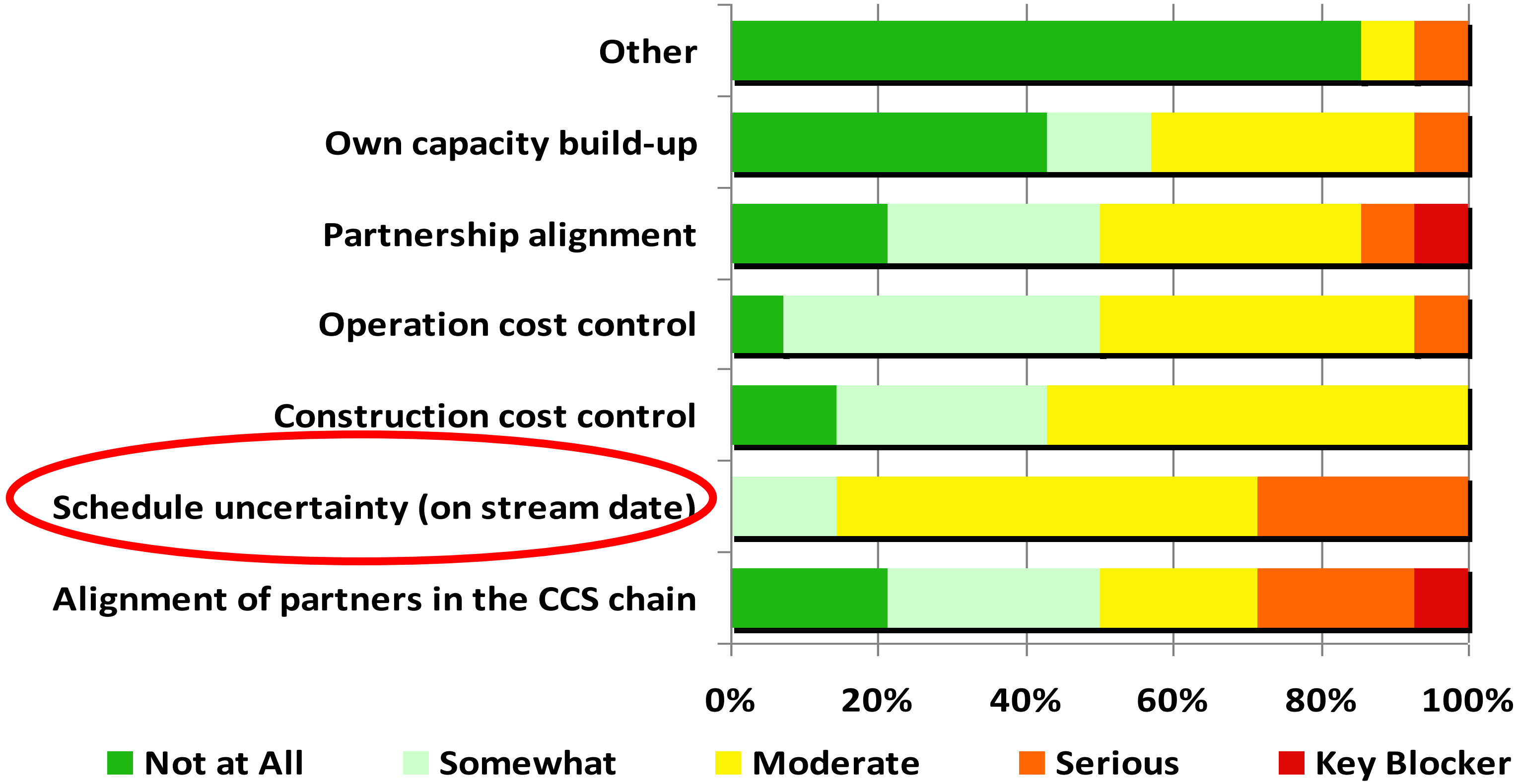


The report with the full results of the survey is available on the ZEP Website at http://www.zeroemissionsplatform.eu/downloads/1088.html

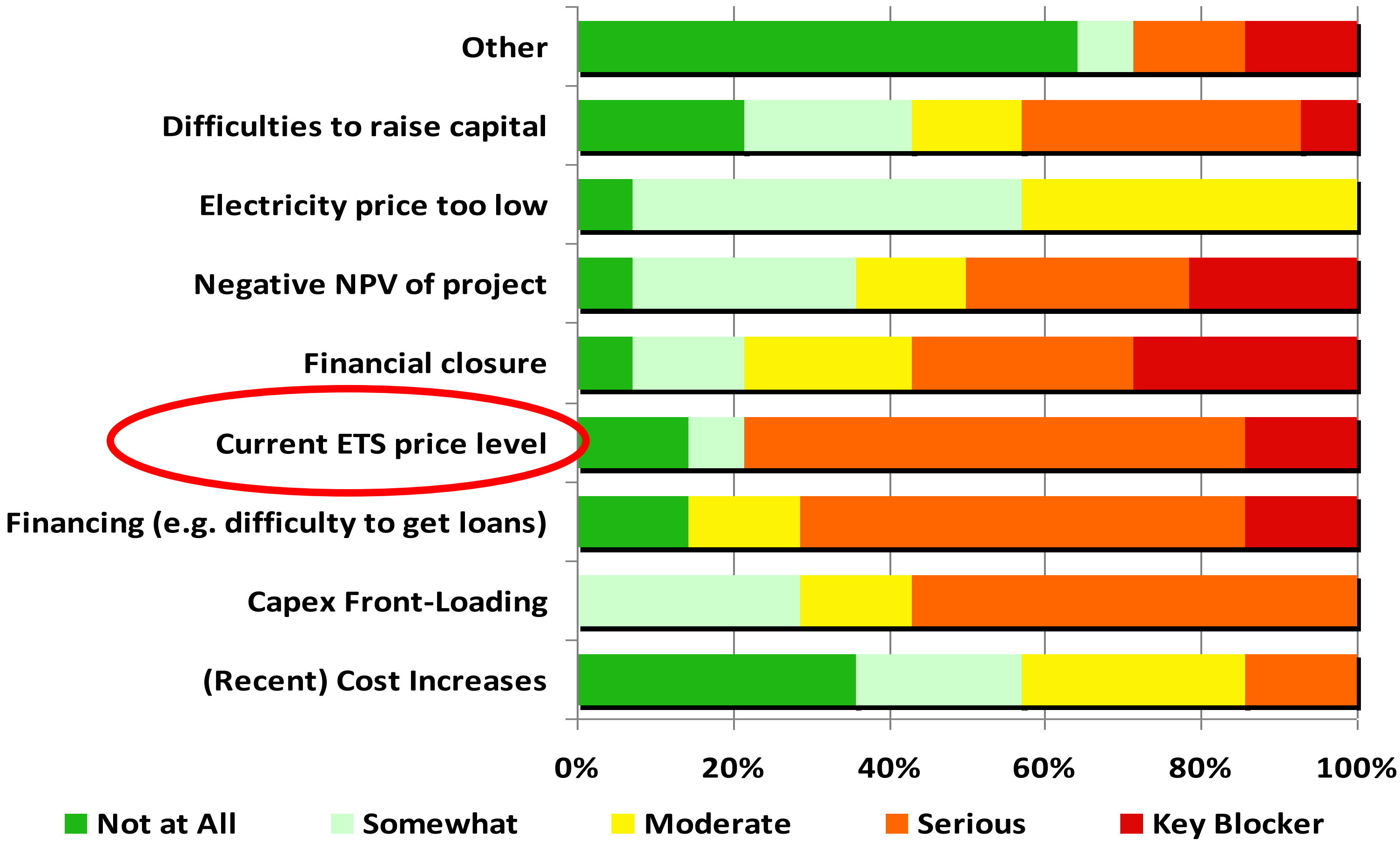
Actual Project Status



Project Management

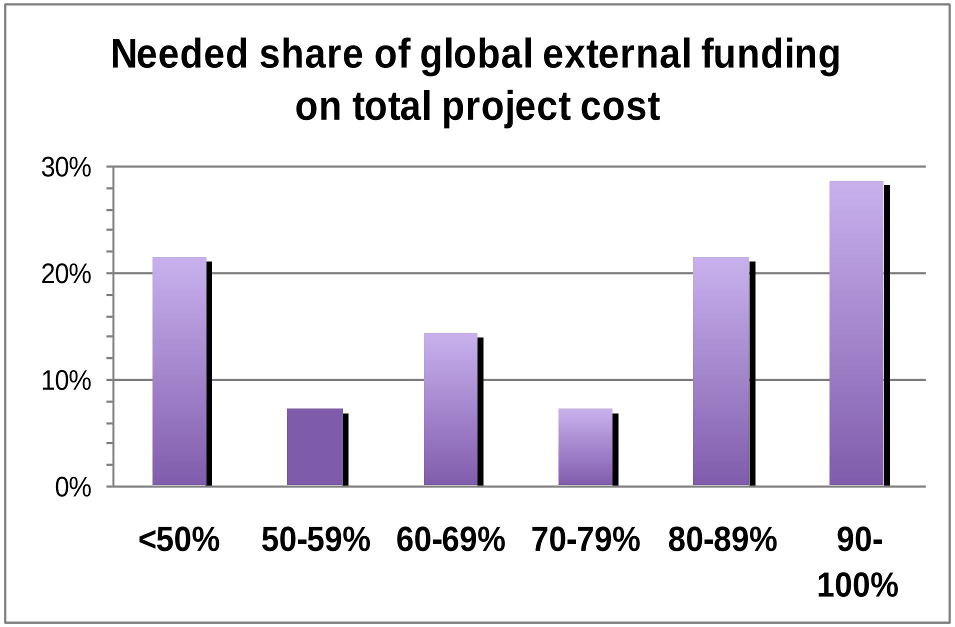


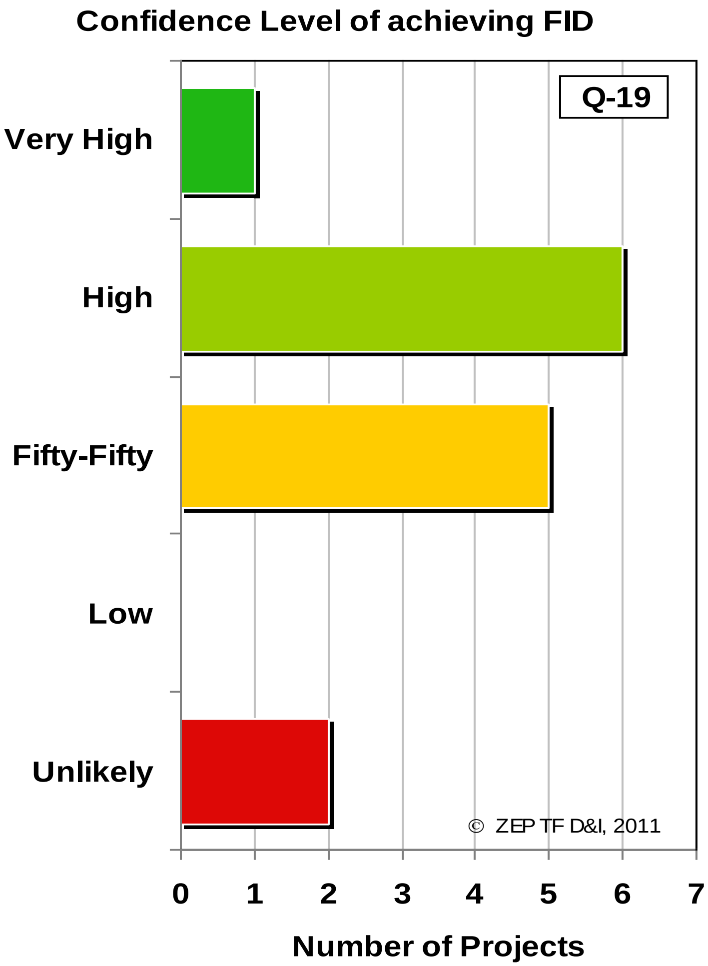
Project Economics



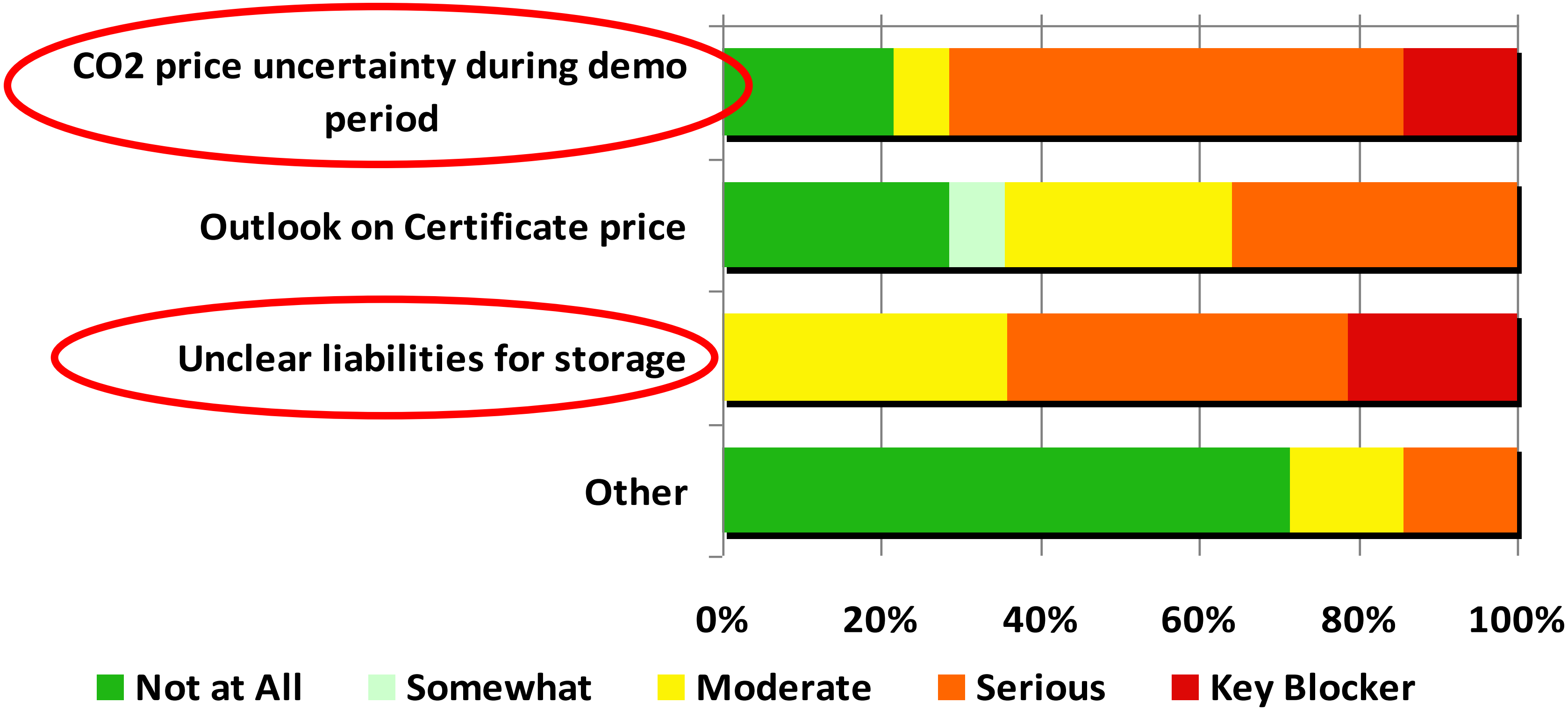
Funding Requirement & Confidence Level for FID

- 50 % of projects need more than 80% funding to achieve FID
- Majority of project managers are optimistic in achieving FID

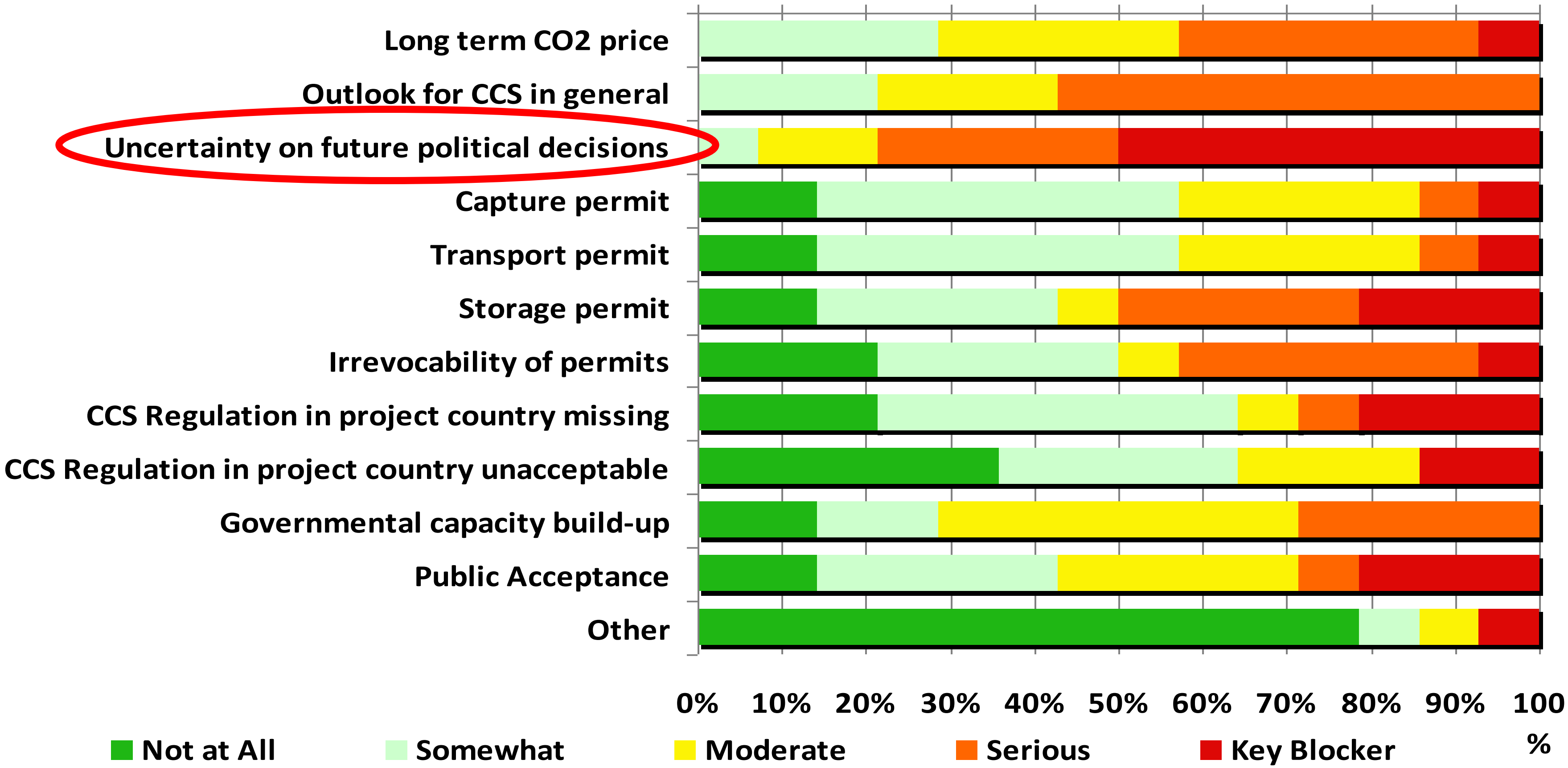




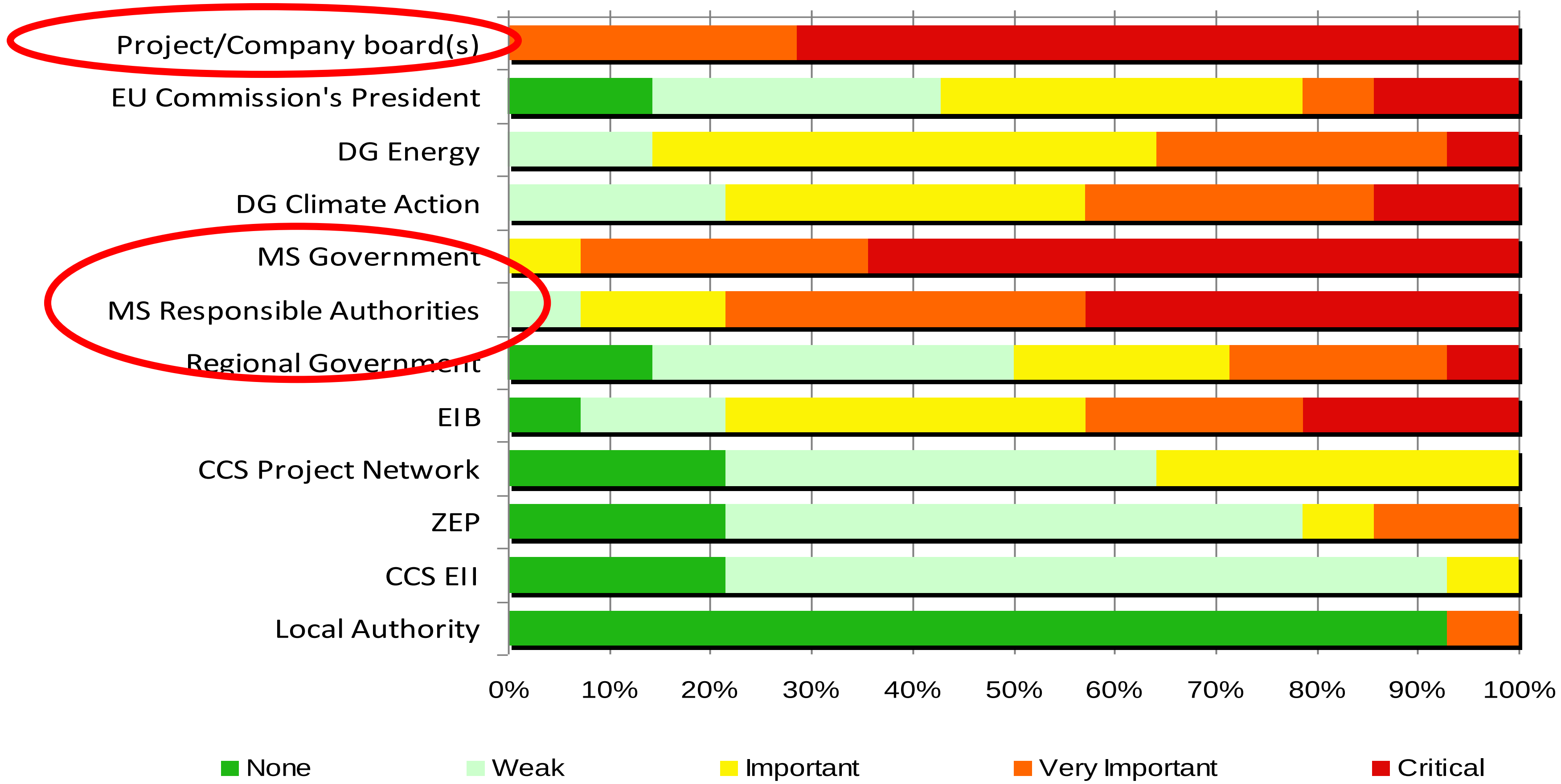
Project Risks



Main results – Regulatory & Policy



Key Decision Makers



Key conclusions of the survey

- 50% of the projects assume that they will be on-stream by 2017
- Key concerns are the low EUA price; uncertainty of future political decisions; and validation of storage permits
- Key decision-making for FID is at Company Board level, but depends heavily on the resolution of issues at Member State level
- Projects typically require more than 50% funding for the additional costs of CO_2 capture, transport and storage
- Confidence level seems high, but technically only one project obtained the storage permit and therefore be ready to take FID by the end of 2012, but has financing gap

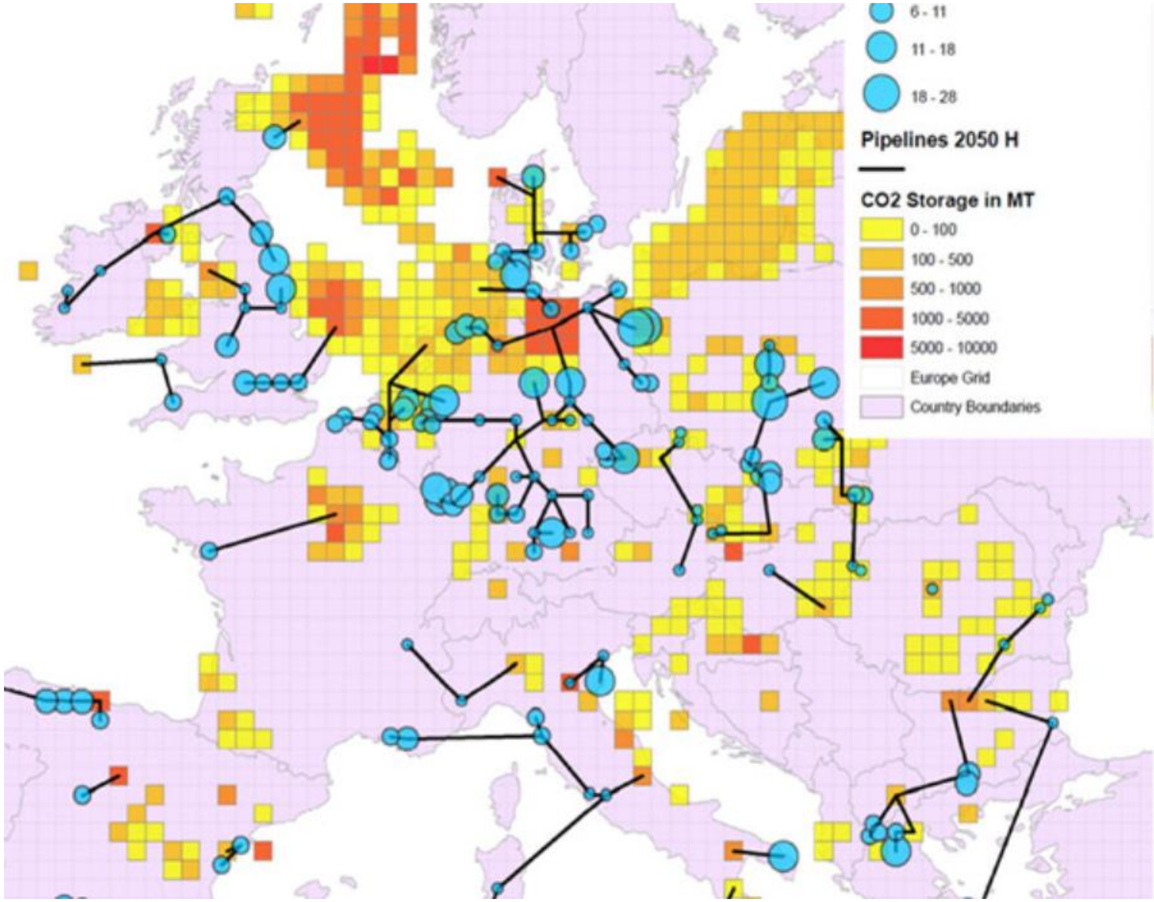
Note:

Actions required to support EU CCS demonstration projects

- **Strengthen the EUA price** as it not only underpins the long-term business case for CCS, but also partly the short-term, as even demonstration projects will need to recover their investment over the medium to long term
- As this will take some years to deliver, establish **additional economic measures at MS/EU level** to enable demonstration projects to take FID..
- ZEP's report, **"*CO_2 capture and Storage (CCS) – Creating a secure environment for investment in Europe*"** **provides concrete recommendations for additional, non-ETS measures** needed for CCS demonstration projects to take FID **– plus any complementary adjustments to the ETS required**
- Industry has already demonstrated its willingness to take on a major portion of the costs and risks of investing in CCS. However, as the NER300 now deliver around €1.5 milion (instead of expected €2.5 billion) for CCS and innovative RES, **additional financial support from MS is vital**
- Provide storage site operators with greater clarity on the **precise modalities for site hand-over and financial security at MS level** and accelerate the validation of storage permits

EU CO_2 Transport Infrastructures

COM(2010)677 – *Energy infrastructures priorities for 2020 and beyond. A blueprint for an integrated European energy network*



Source: *ARUP Europe-Wide CO_2 Infrastructure Study for DG Energy, October 2010*

TIMING IS CRUCIAL

CCS is on the critical path to deliver the *EU Energy Roadmap 2050*, with no margin for delay:

- **demonstration projects *must* take FID imminently to secure public funding**
- **commercial projects *must* be available from 2020 to ensure wide deployment from 2030.**

Thank you!

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