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CSLF Technology Roadmap (TRM) 2017

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Acknowledgements

- TRM responsibility: CSLF Project Interaction and Review Team (PIRT).
- TRM was prepared by an editorial committee with the following members:
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  - Tony Surridge, South Africa
  - John Litynski, USA
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- A number of international experts and TG delegates have commented on and made contributions to the TRM.

Main changes from TRM 2013

- Focus moved away from R&D to implementation and learning from experience (CCS works)
- More emphasis on development of clusters and hubs, and on industrial and biomass CCS
- Recommendations in grey area between technical and policy

- RD&D on novel, emerging, innovative or transformational technologies: Matter for Mission Innovation

Main changes from TRM 2013

- New time horizon for medium- and long-term recommendations and targets,
  - 2025 and 2035 vs. earlier 2030 and 2050
  - Kept 2020 to emphasise the need for immediate acceleration
- Revised background chapter to reflect COP21 targets
- Introduced quantitative targets that meet IEA 2 ^{o}C scenario
- Added section on non-technical measures, including regulations
- Defined CCUS as subset of CCS

Main Findings (1)

Based on reviews of several status reports on CCS and technical papers, as well as comments and input from international experts, the main findings of this *Technology Roadmap 2017* are as follows:

- CCS has been proven to work and has been implemented in the power and industrial sectors.
- The coming years are critical for CCS; therefore, a sense of urgency must be built to drive action.
- Substantial, and perhaps, unprecedented investment in CCS and other low-carbon technologies is needed to achieve the targets of the Paris Agreement.
- The main barriers to implementation are inadequate government investment and policy support/incentives, challenging project economics, and uncertainties and risk that stifle private sector investment.

Main Findings (2)

Based on reviews of several status reports on CCS and technical papers, as well as comments and input from international experts, the main findings of this *Technology Roadmap 2017* are as follows:

- Rapid deployment of CCS is critical in the industry and power sectors, especially in those industries for which CCS is the most realistic path to decarbonization.
- Negative CO_2 emissions can be achieved by using a combination of biomass and CCS.
- Costs and implementation risks can be reduced by developing industrial clusters and CO_2 transport and storage hubs.
- Members of the CSLF consider it critical that public-private partnerships facilitate material and timely cost reductions and accelerated implementation of CCS.

Priority Recommendations (1)

Governments and industries must collaborate to ensure that CCS contributes its share to the Paris Agreement's aim to keep the global temperature increase from anthropogenic CO_2 emissions to 2°C or below by implementing sufficient large-scale projects in the power and industry sectors to achieve the following:

- **Long-term isolation from the atmosphere of at least 400 megatonnes (Mt) CO_2 per year by 2025 (or permanent capture and storage of in total 1,800 Mt CO_2).**
- **Long-term isolation from the atmosphere of at least 2,400 Mt CO_2 per year by 2035 (or permanent capture and storage of in total 16,000 Mt CO_2).**

Priority Recommendations (2)

To this end, CSLF members recommend the following actions to the CSLF Ministers:

- **Promote the value of CCS in achieving domestic energy goals and global climate goals.**
- **Incentivize investments in CCS by developing and implementing policy frameworks.**
- **Facilitate innovative business models for CCS projects.**
- **Implement legal and regulatory frameworks for CCS.**
- **Facilitate CCS infrastructure development.**

Priority Recommendations (3)

- **Build trust and engage stakeholders through CCS public outreach and education.**
- **Leverage existing large-scale projects to promote knowledge-exchange opportunities.**
- **Drive costs down along the whole CCS chain through RD&D.**
- **Accelerate CCS in developing countries by funding storage appraisals and technology readiness assessments.**
- **Facilitate implementation of CO_2 utilization**

Governments have a critical role in accelerating the deployment of CCS.

Thank you for your attention!