

Market and Regulatory Issues – Bio CCS/CCU  
*Brussels, 16 January 2018*



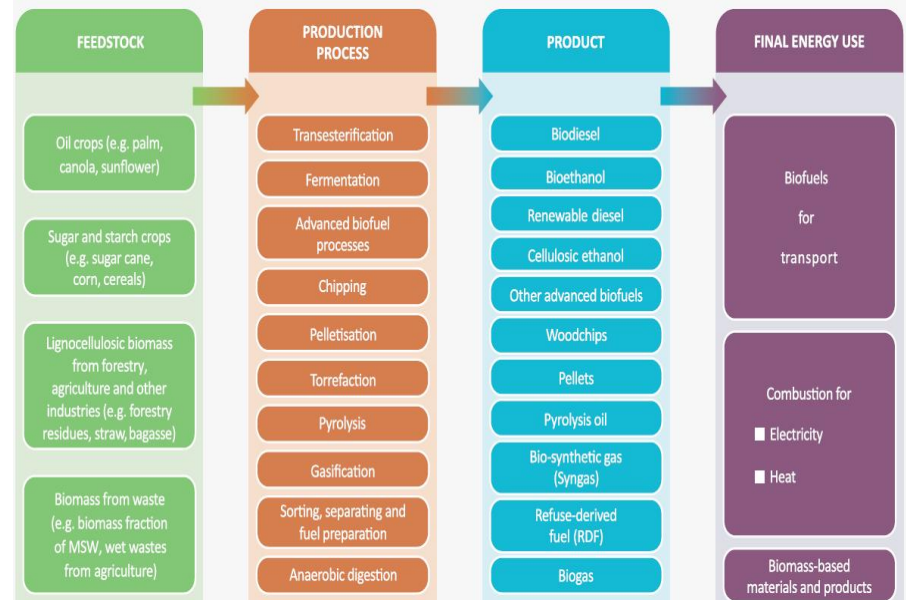
BECCS and BECCU in the IEA Bioenergy  
Roadmap

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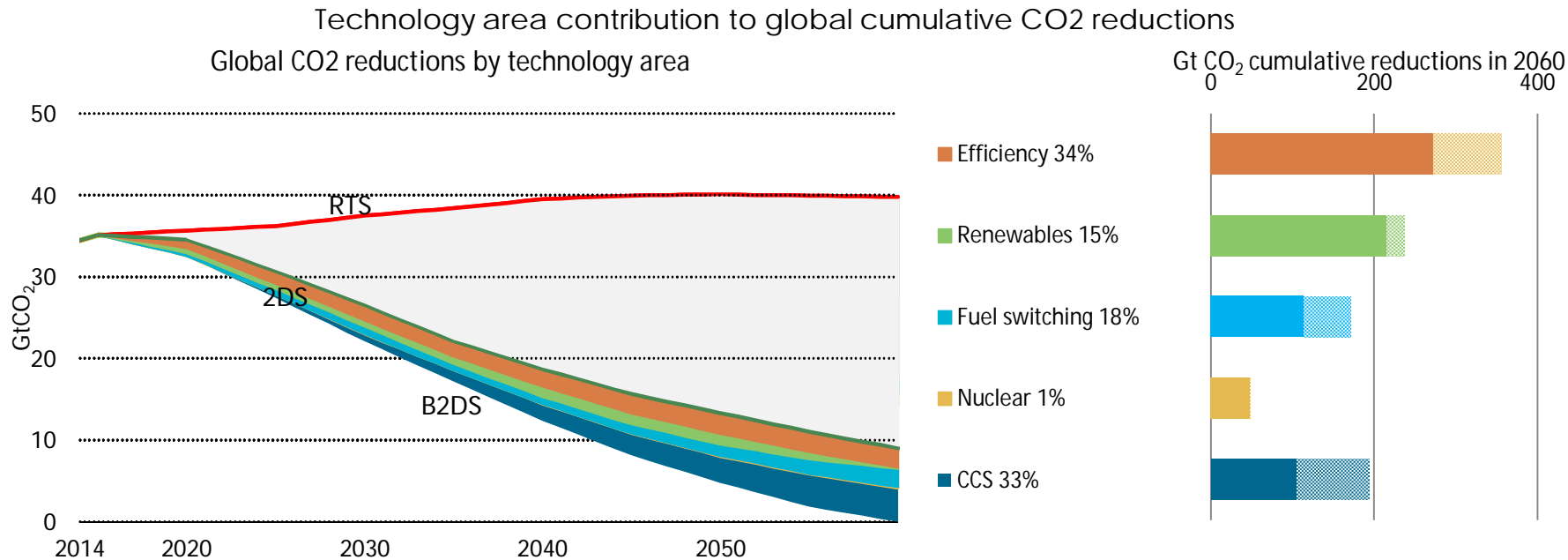
# Sustainable bioenergy

- Bioenergy can be a major part of a low carbon energy system, providing low-carbon transport fuels, electricity, and heat as part of a growing bioeconomy.
- To play these roles bioenergy must be deployed sustainably.
- But bioenergy is complex and sometimes controversial. General statements and oversimplification are unhelpful.
- There is growing consensus on what constitutes sustainable best practice.



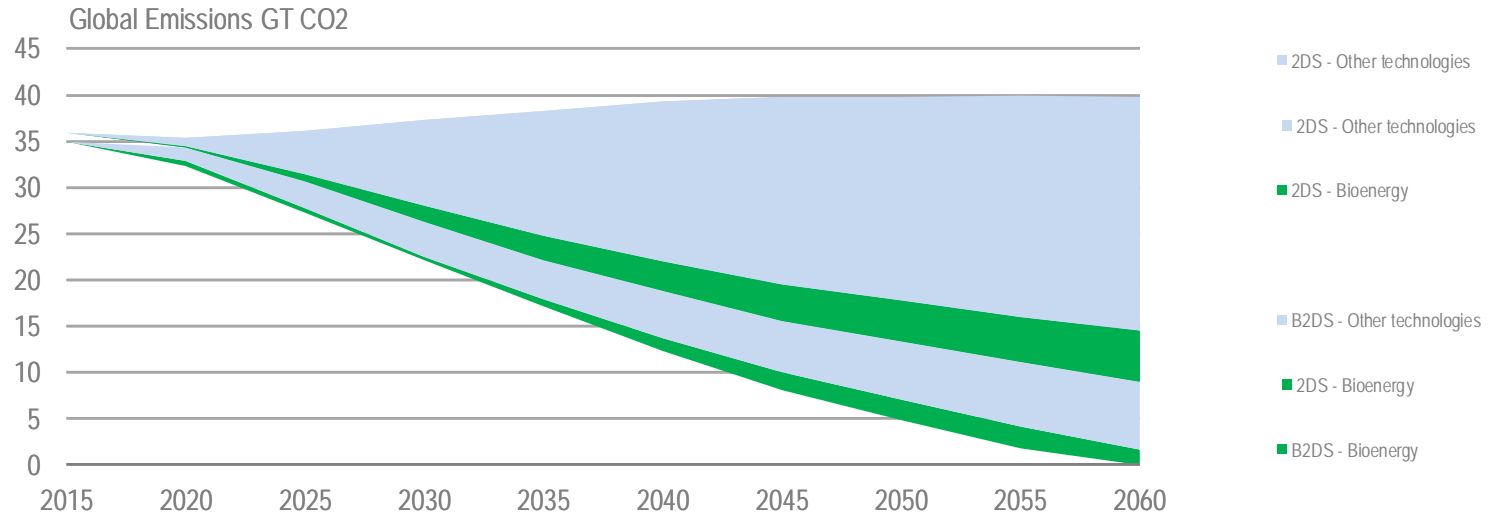
Bioenergy now needs a new impetus based on up to date evidence and experience

# The full portfolio of technologies is needed for decarbonisation



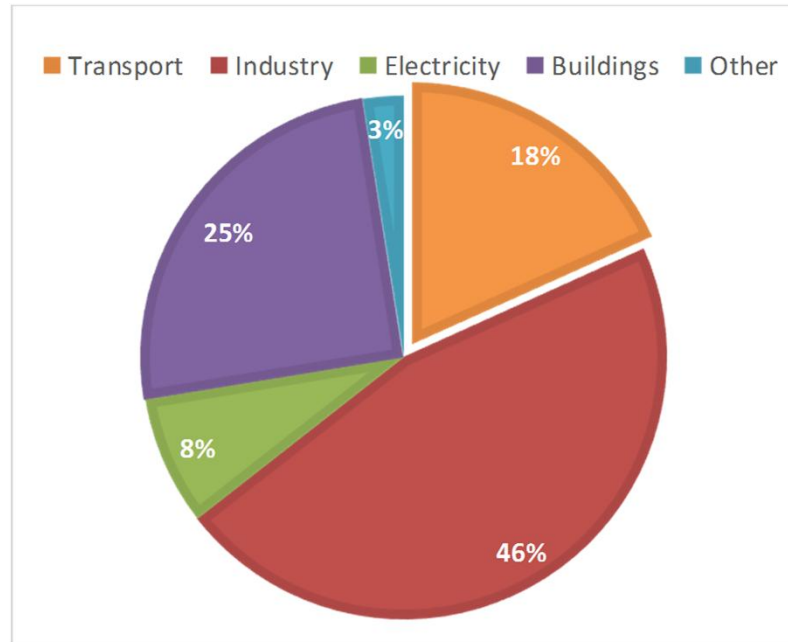
Delivering deep carbon emission reductions will require an unprecedented effort in technology innovation and diversification worldwide

## Role of Bioenergy



Bioenergy to provide some 17% of cumulative carbon savings to 2060 in the 2DS and around 22% of additional cumulative reductions in the B2DS, including an important contribution from BECCS

## Modern bioenergy in final energy consumption 2015



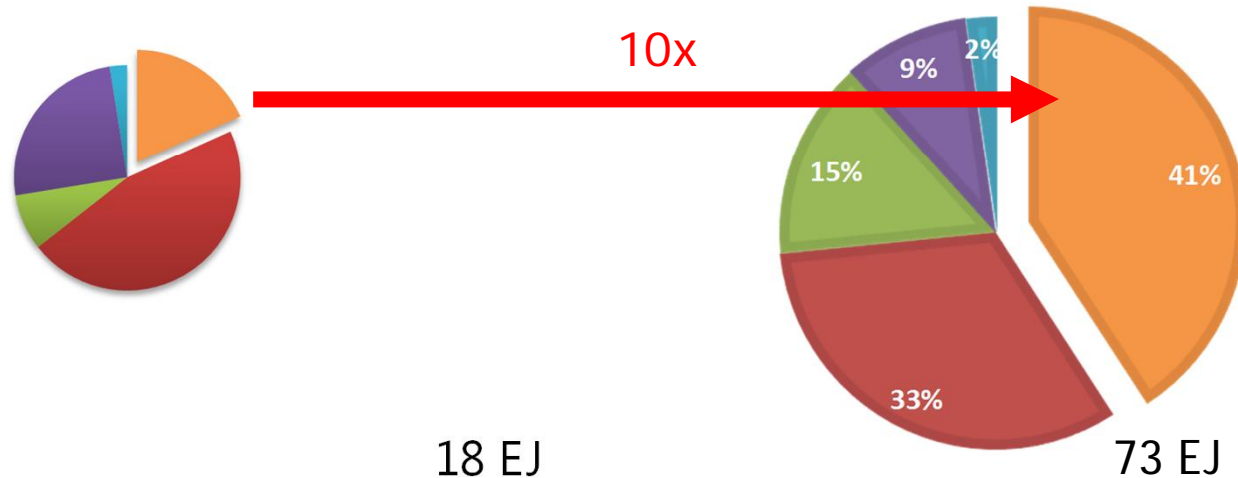
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## Modern bioenergy in final energy consumption

2015

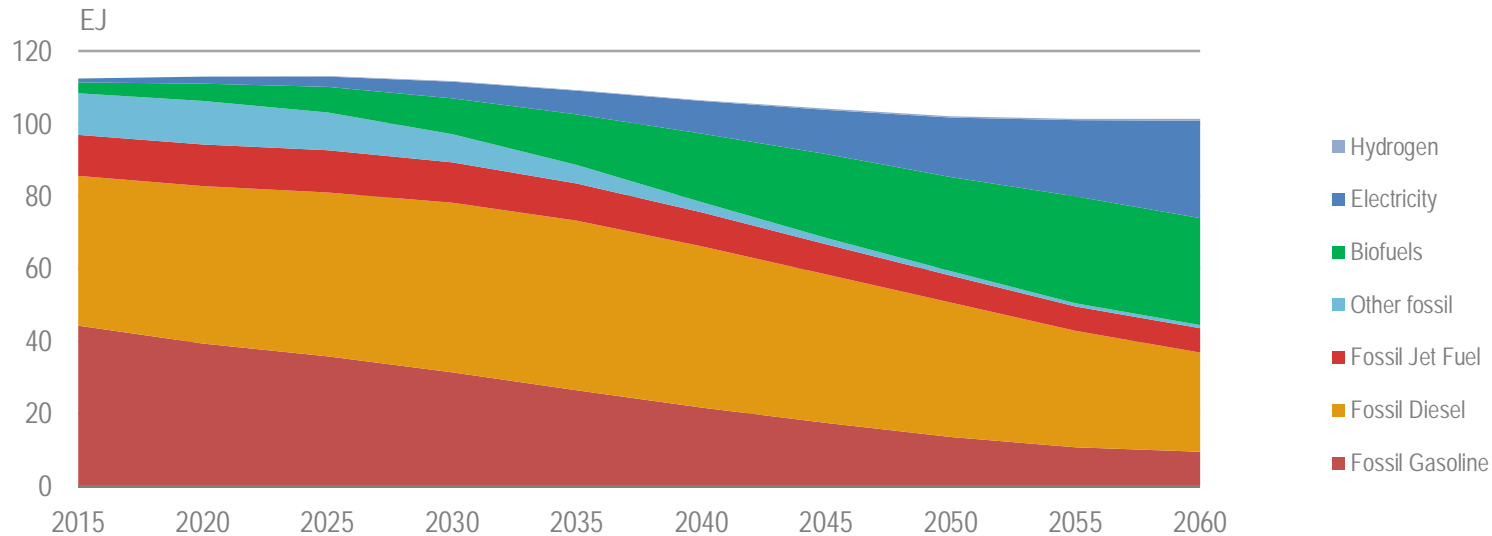
Transport Industry Electricity Modern biomass heating Other

2060



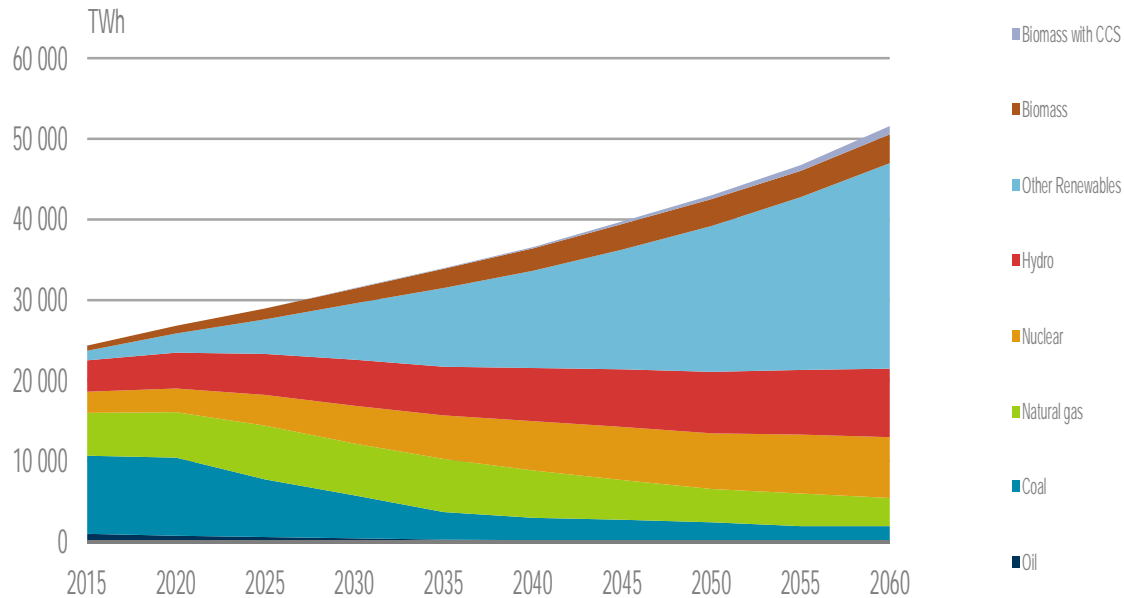
Total final energy consumption of sustainable bioenergy increases four times by 2060 in the 2DS. Use of sustainable biofuels for transport increases tenfold, with a large majority of advanced biofuels

## Transport Fuels – 2DS



While demand of transport services more than doubles , biofuels complement end-use efficiency and strong growth in electricity, providing almost 30% of transport final energy demand in 2060

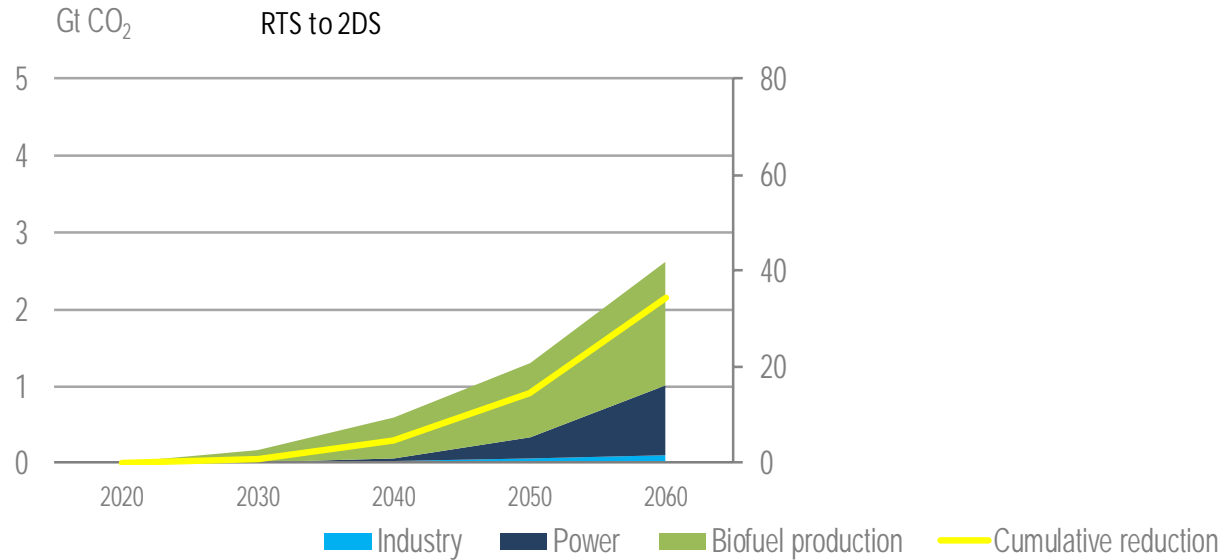
# Electricity generation in 2DS



Bio-electricity grows 7X and goes from 2 to 7% of electricity generation

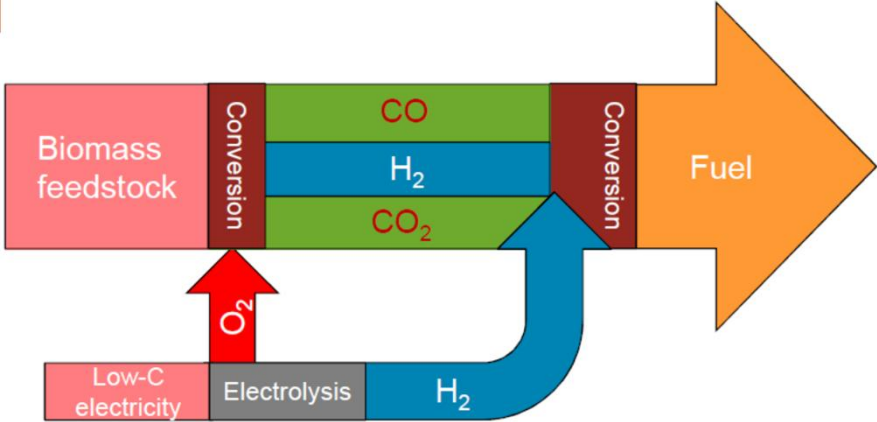
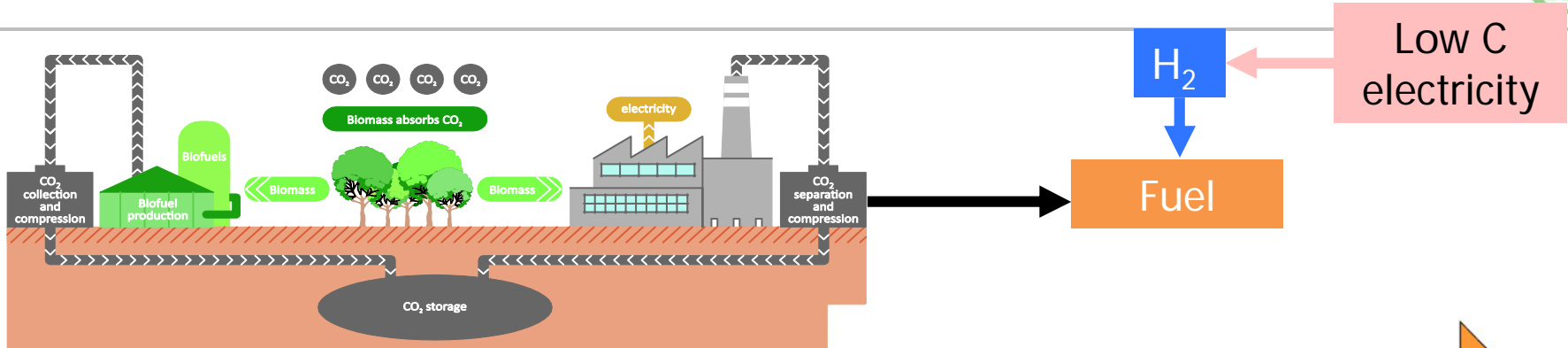


1. Promote short term deployment of mature options
2. Stimulate the development and deployment of new technologies
3. Deliver the necessary feedstock sustainably, backed by a supportive sustainability governance system
4. Develop capacity and catalyse investment via a coordinated international collaboration effort



BECCS plays a critically important role in 2DS and B2DS

# BECCU



Source: Hannula, VTT, 2016

More bioenergy per unit of biomass!

- High carbon price which properly rewards double carbon benefit of BECCS
- Specific technology support measures
  - Studies of optimized systems
  - Practical projects
  - Infrastructure planning
- Emission limits from biomass plants

Early action will requires enormous ambition from Governments

- Sustainable bioenergy is an essential element in the portfolio of measures needed for a low carbon scenario.
- Biofuels can play a particularly important role in the transport sector, complementing energy efficiency measures and electrification, and with a special role in aviation, shipping and other long haul transport, but also grows in industry, electricity and buildings. However progress is much slower than necessary and acceleration is urgently needed.
- BECCS plays an important role in the 2DS and especially the B2DS scenario.
- BECCU offers a route to improved use of the bio-carbon so reducing resource needed.
- Early policy action and a high level of ambition essential to BECCS/BECCU deployment

Roadmap available on line at:

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IEA Bioenergy Roadmap

[www.iea.org/publications/freepublications/publication/technology-roadmap-on-bioenergy.html](http://www.iea.org/publications/freepublications/publication/technology-roadmap-on-bioenergy.html).

Renewable Energy for Industry

<https://www.iea.org/publications/insights/insightpublications/renewable-energy-for-industry.html>

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