



IEA Technology Roadmap: Delivering sustainable bioenergy - a key role for advanced biofuels

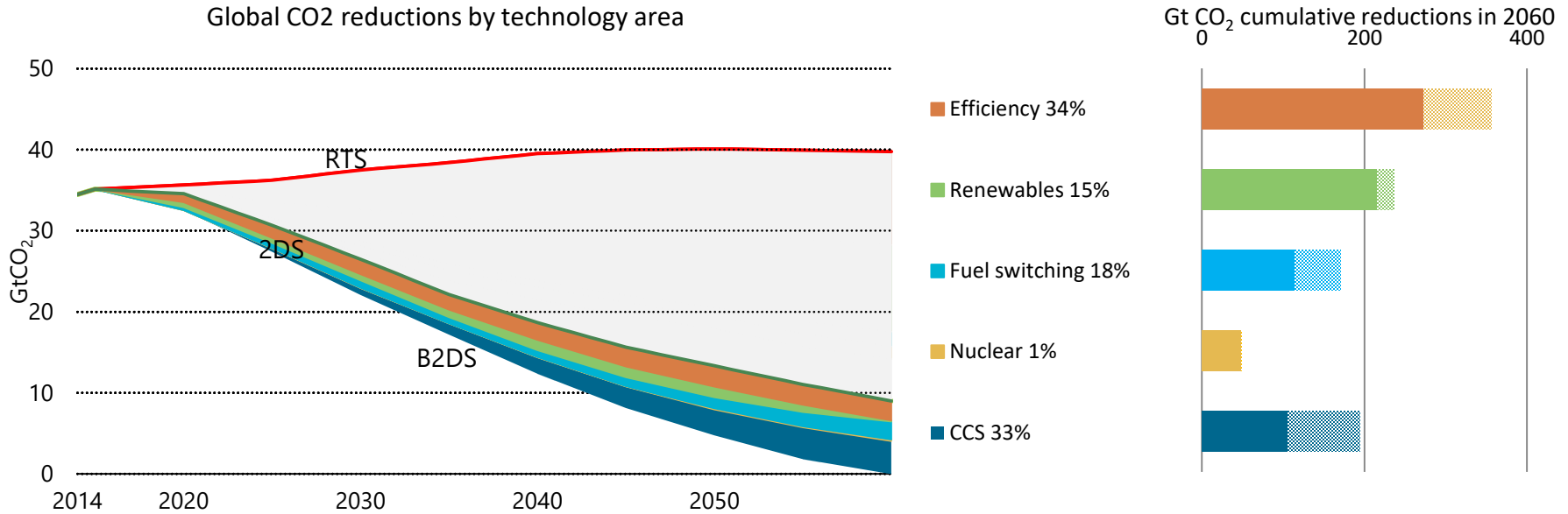
Adam Brown

EU-India Conference on Advanced Biofuels, Delhi 6-8 March 2018

The full portfolio of technologies is needed for decarbonisation

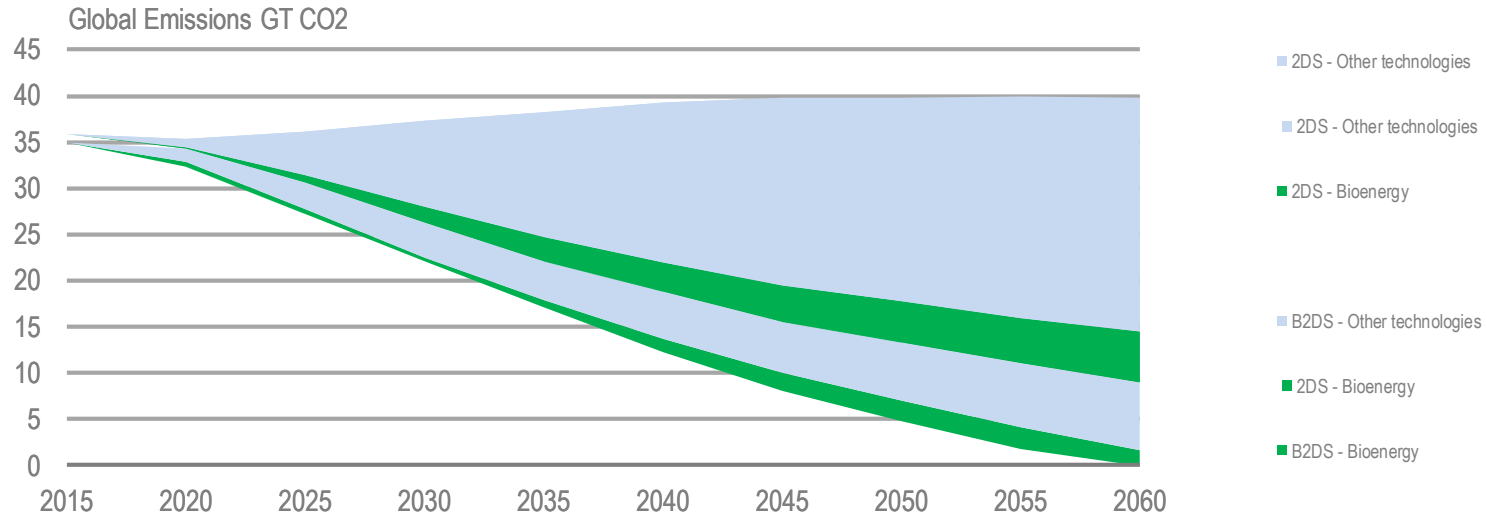


Technology area contribution to global cumulative CO2 reductions



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

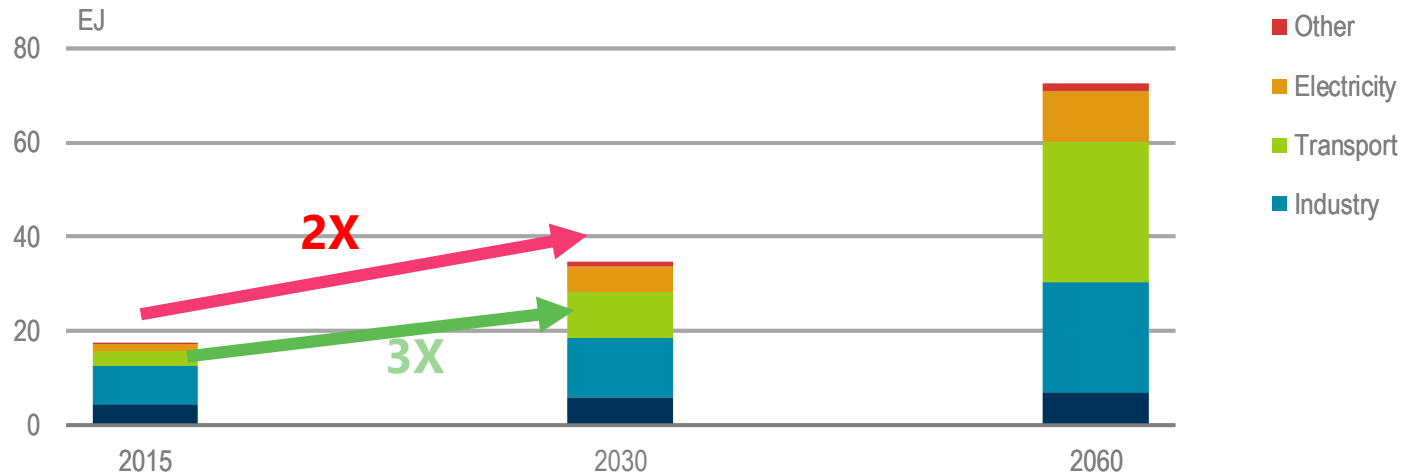
Role of Bioenergy



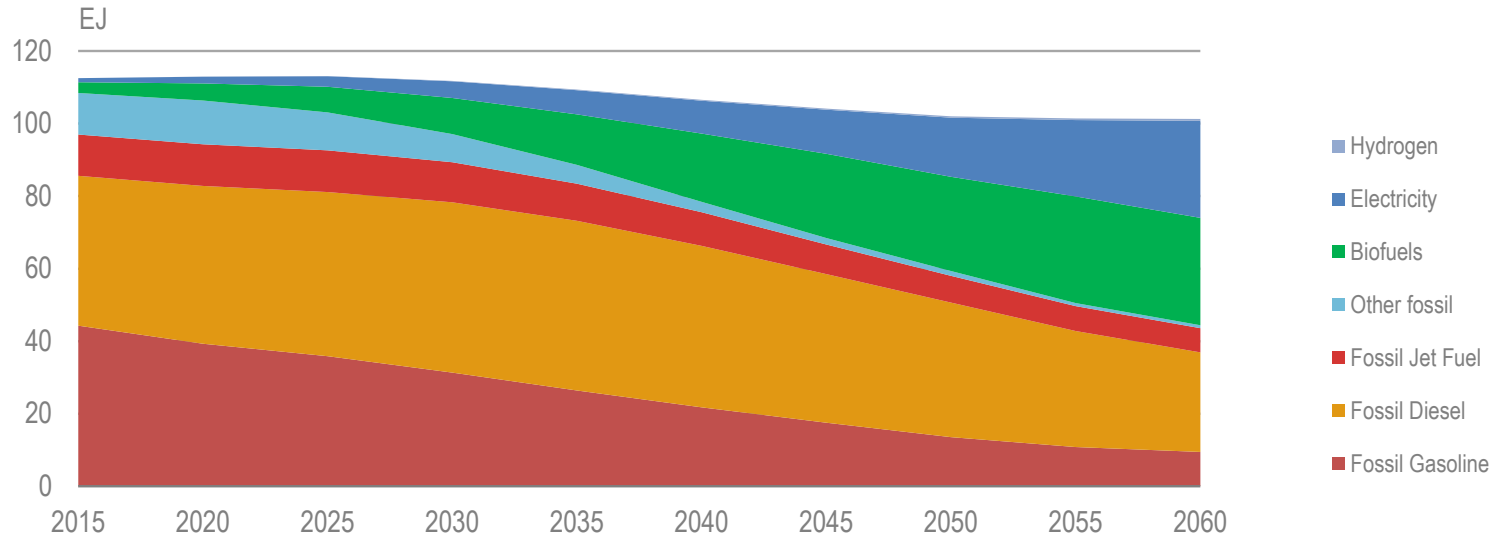
Bioenergy to provide some 17% of cumulative carbon savings to 2060 in the 2DS and around 22% of additional cumulative reductions in the B2DS, including an important contribution from BECCS

Strong acceleration needed between now and 2030

Modern bioenergy in final energy consumption in 2DS

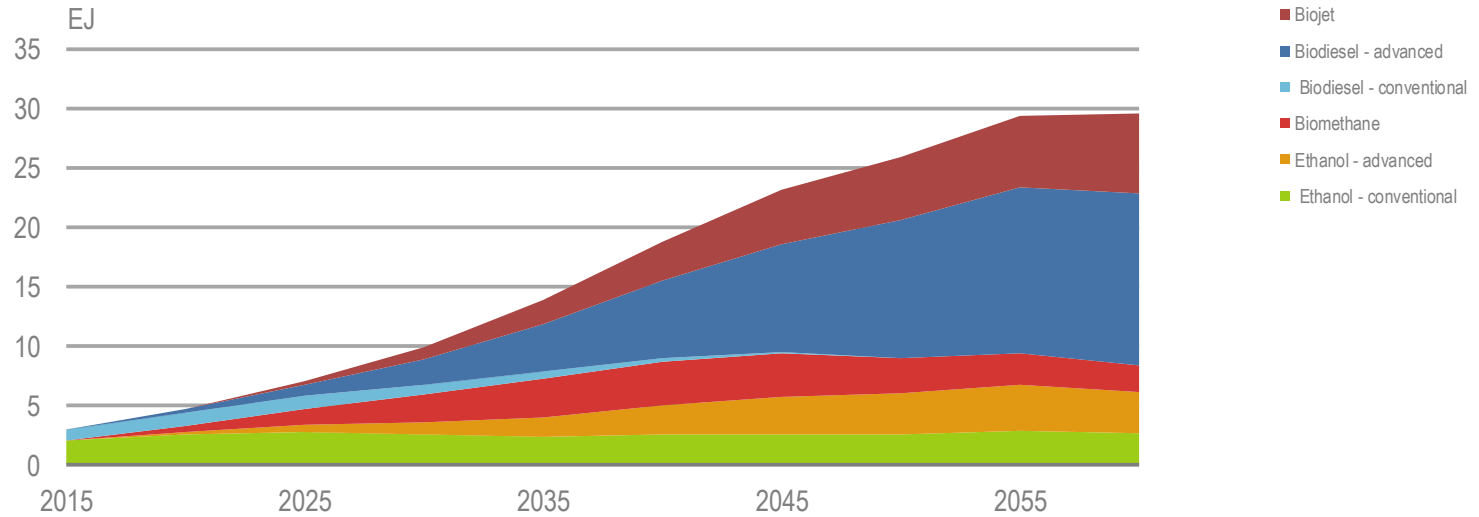


Transport Fuels – 2DS



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

Advanced biofuels play a key role

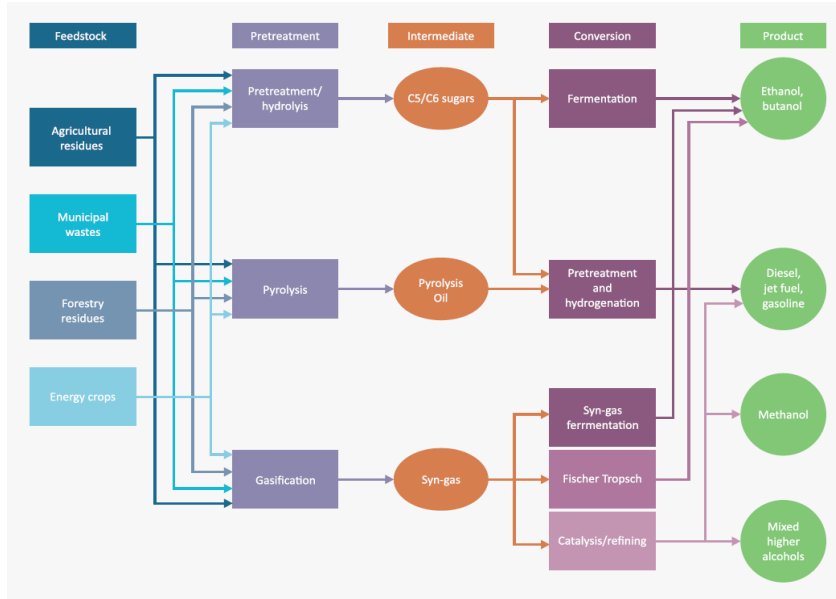


1. Promote short term deployment of **mature options**
2. Stimulate the development and deployment of **new technologies**
3. Deliver the necessary feedstock **sustainably**, backed by a supportive sustainability governance system
4. Develop capacity and catalyse investment via a coordinated **international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

Need for appropriate policy frameworks

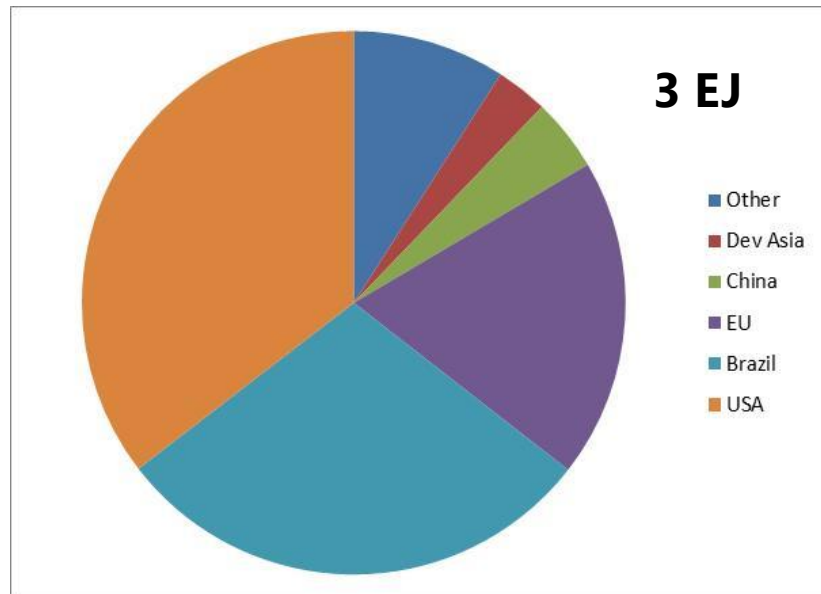
2. Stimulate development and deployment of new technologies

Some routes to new biofuels



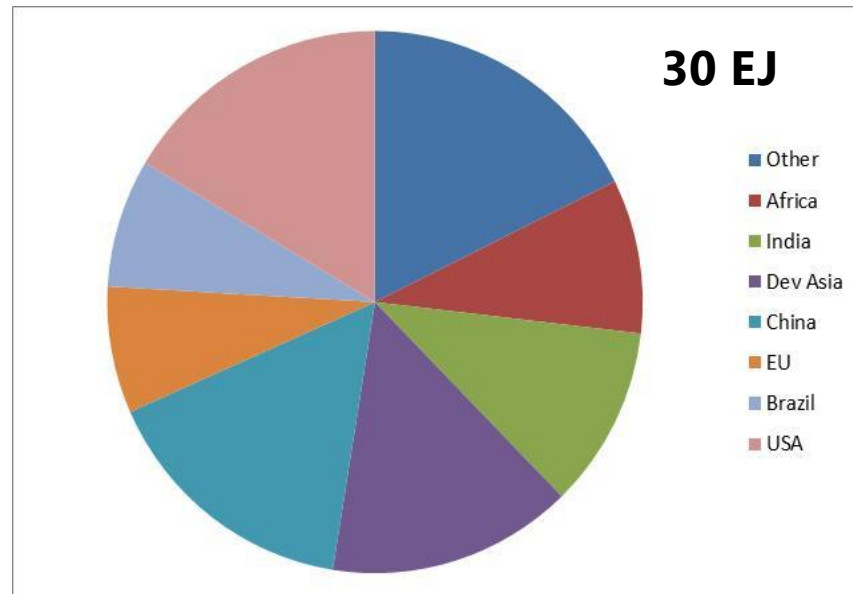
- **New technologies needed with good carbon performance and adapted to market roles in 2DS.**
- Continued R,D and D to reduce costs and **improve GHG performance** of existing biofuels technologies
- Demonstrate **reliable performance** from existing “novel biofuels” plants
- Develop and demonstrate routes to diesel and biojet with **improved costs, better C balances and GHG performance** (link to RE H₂ production)
- Identify potential and development paths for **cost reduction**

Regional Biofuels Demand 2015



85% of biofuels used in US, Brazil and EU

Regional Biofuels Demand 2060 – 2DS



China, Other Asia, India and Africa become major markets

- 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 sectors.
- Advanced biofuels key to success – low emissions, use in aviation and shipping
- Progress is much slower than necessary so we need to
 - Expand deployment of existing technologies
 - **Commercialise the new technologies**
 - Develop sustainable supply chains and appropriate sustainability governance systems
 - Build technical and regulatory capacity **in a much wider range of countries and regions**
- Welcome initiatives in India to diversify production and use!

For further insights and analysis...

- Technology Roadmap - delivering sustainable bioenergy

www.iea.org/publications/freepublications/publication/technology-roadmap-on-bioenergy.html.

- Energy Technology Perspectives 2017
- Renewables 2017 Market Report
- How2Guide for Bioenergy

For more information see: www.iea.org/publications/

