



REmap 2030

A Renewable Energy Roadmap



Emerging biofuel production technologies and outlook
from REmap 2030

www.irena.org/remap

About IRENA

IRENA is an intergovernmental organisation that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international cooperation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy.



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IRENA Renewable Energy Learning Partnership



A screenshot of the IRENA Renewable Energy Learning Partnership website homepage. The page has a dark blue navigation bar at the top with links for Home, About IRELP, Career Centre, Education Centre, Community, and Contact Us. Below the navigation bar, there are several content blocks: a green "About IRELP" block with a "read more" link; a video player showing a video about the partnership; a teal "News" block with a "read more" link; a purple "Career Centre" block featuring a photo of a man and a "Read More" link; a blue "Education Centre" block with a "read more" link and buttons for "COURSES", "WEBINARS", "TRAINING GUIDES", and "IRENA SCHOLARSHIP PROGRAMME"; a blue "Internship Opportunities" block with a "read more" link; and a green "Subscribe" block with an email icon and a "read more" link.

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Agenda

Brief introduction to REmap 2030 and transport sector findings and IRENA technology outlook for production and deployment of advanced biofuels – 10 min

Speaker presentations – 35 min

Market prospects for biofuels with a view on important regions

Marc Londo, Senior Consultant, Energy Research Centre of the Netherlands (ECN)

Production of second generation biofuels based on biomass gasification

Gerald Weber, Researcher, Bioenergy2020+

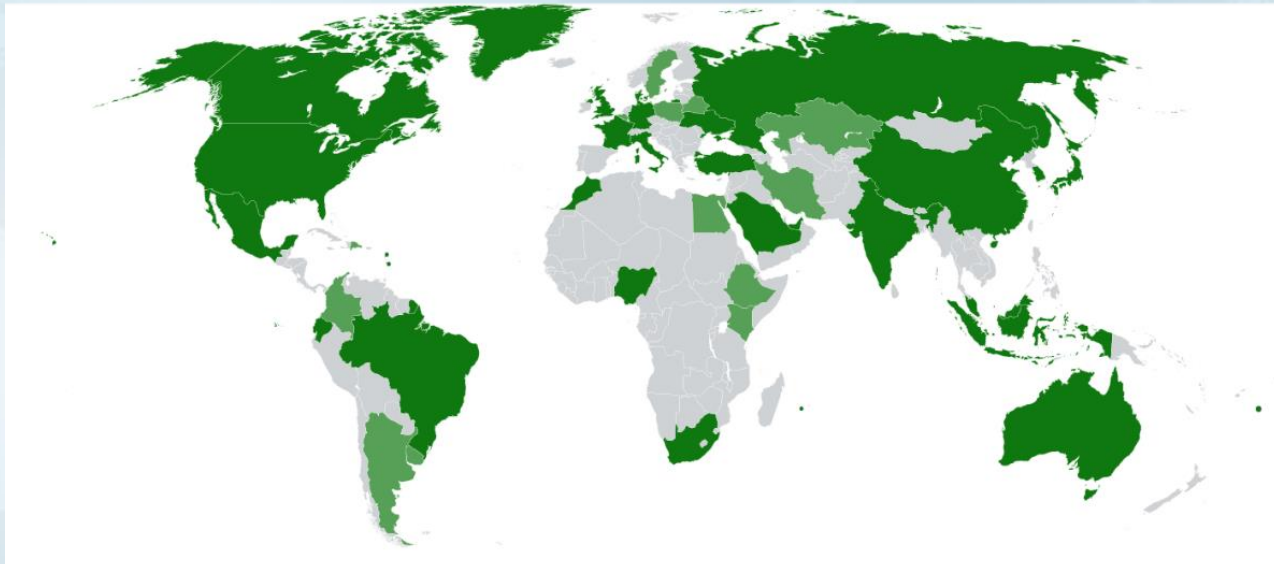
Biofuel uses, what are the prospects for aviation and shipping?

Jack Saddler, UBC Forest Products Biotechnology/Bioenergy group, Co-Task Leader, IEA Bioenergy Liquid Biofuels

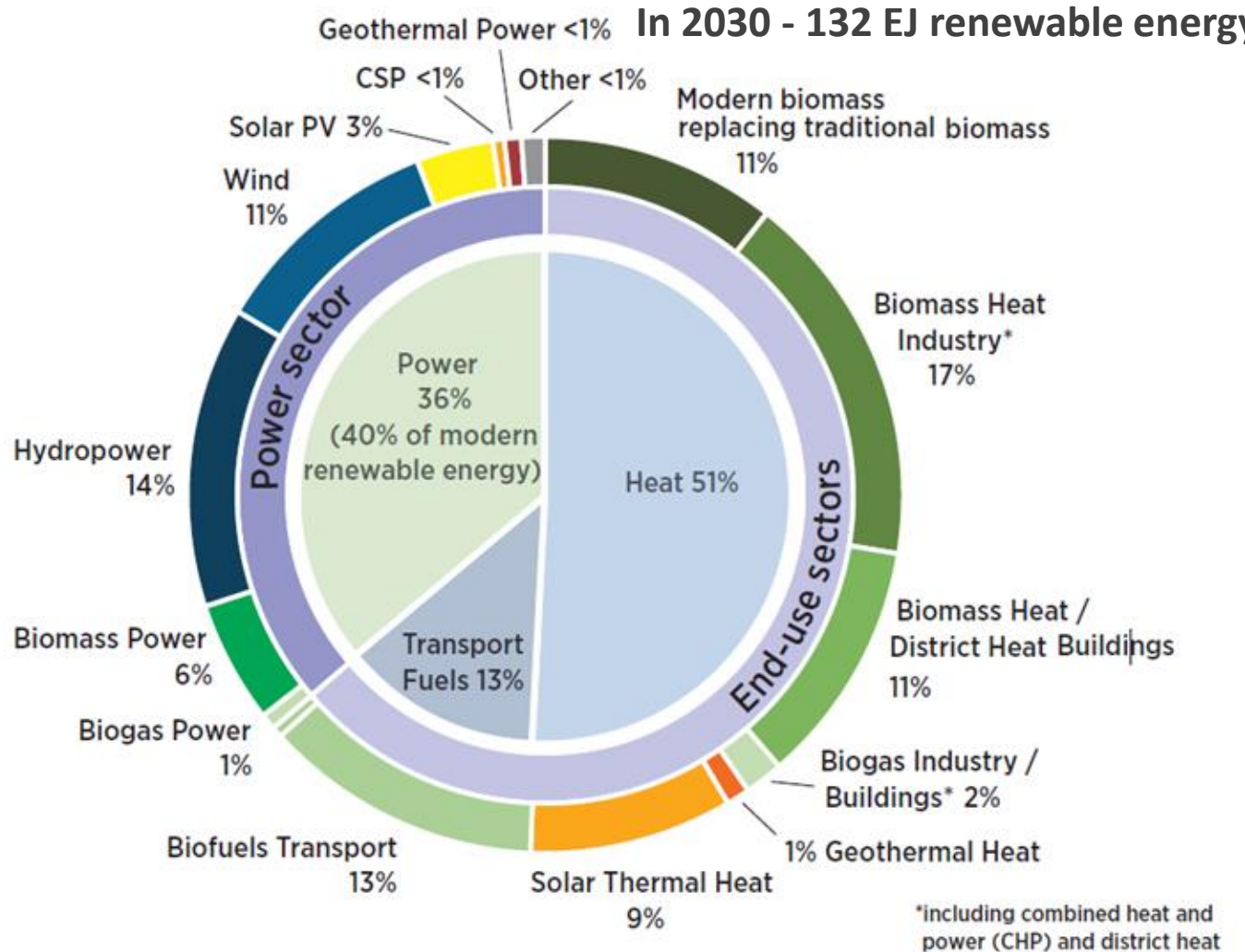
Q&A – 15 min

REmap 2030

- REmap explores the **potential, cost** and **benefits** of doubling the renewables share in the global energy mix
- Focuses on power, district heat and end-use sectors including transport
- Coverage: **40 countries**; 80% of the global energy use

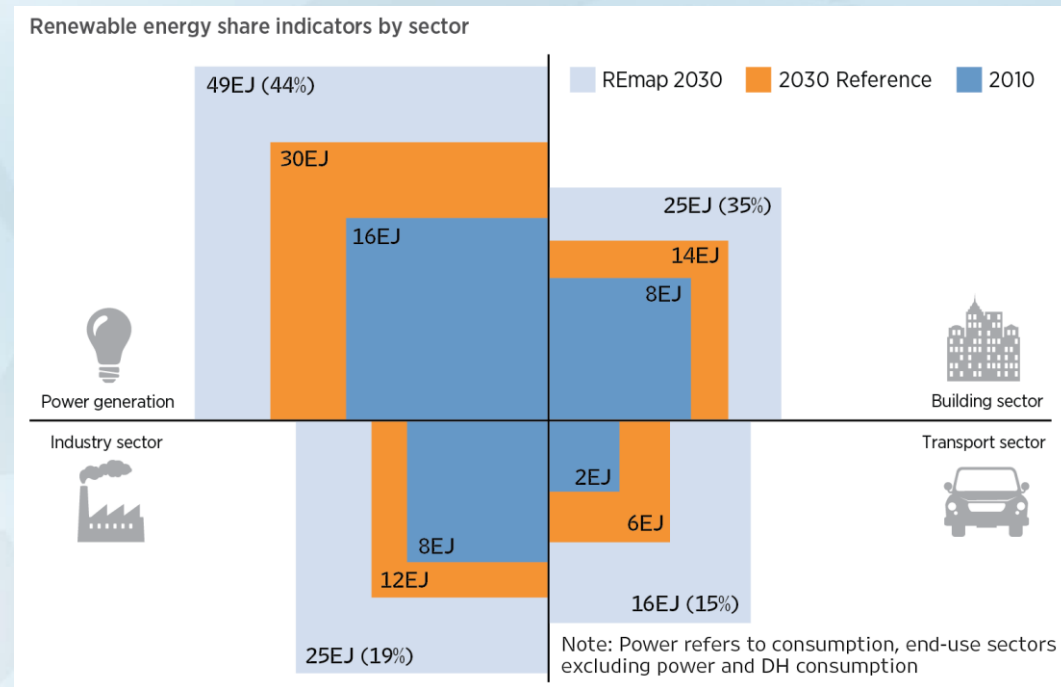


There is a need to unleash innovation (RE+), notably for end-use sectors



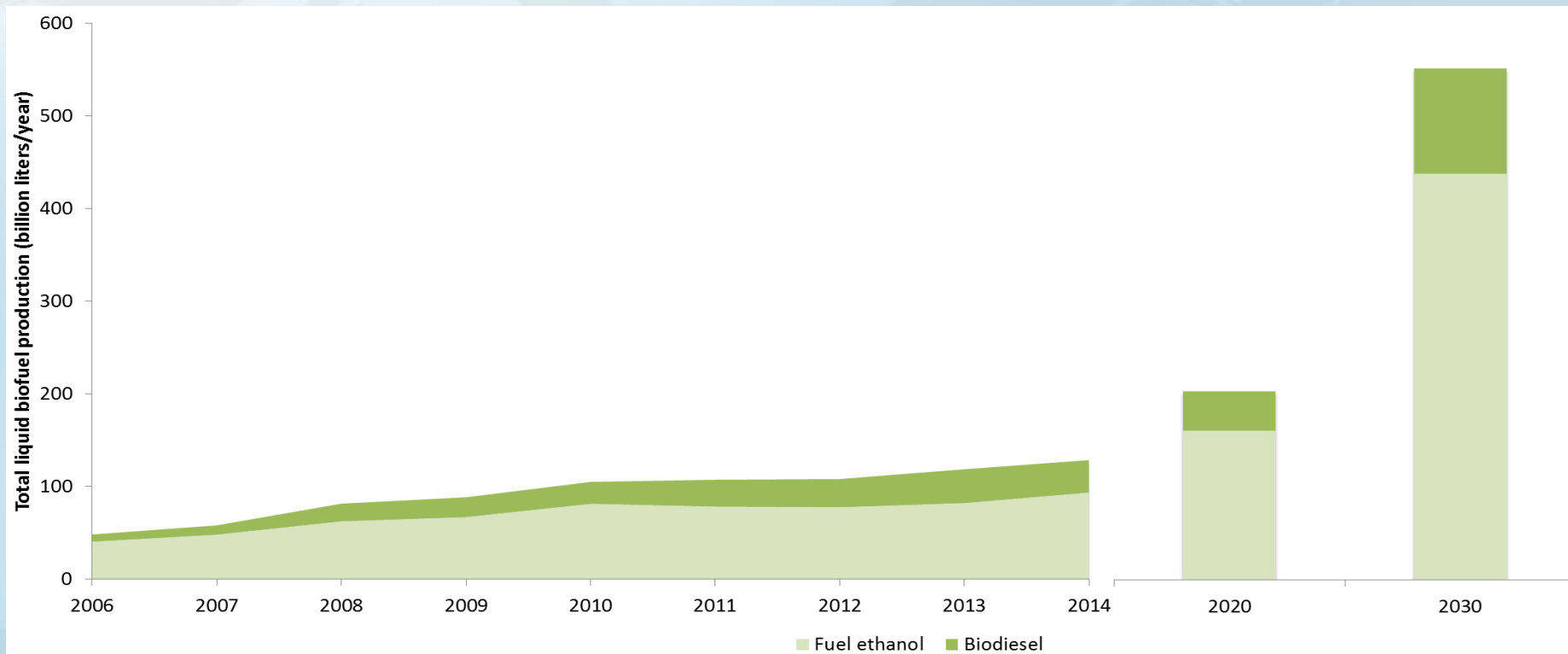
Transport sector RE share increases from **3% today to just 5% in reference case, under REmap this could triple to 15%**

- Biofuels **4x growth** over today's level, 25% advanced biofuel share
- Electric vehicles see significant growth, reaching **160 million by 2030**, or 10% total car fleet
- An additional **500+ million electric 2/3 wheelers**



Liquid biofuels demand in REmap 2030 – DRAFT results

Potentially a four fold increase in liquid biofuels production between today and 2030
At least one-fourth is advanced biofuels, up from very little today
Majority still conventional biofuels



Note: findings are still preliminary and could be revised

REmap shows need to enhanced action to support sustainable transport, IRENA is engaged with various activities:

- **REmap Transport Action Team:** network of 100+ experts focused on themes of electric mobility, biofuels and options for shipping and aviation
 - Through webinars, data and information sharing
 - **New team members welcome**
- **Innovation technology outlook of advanced biofuels**
- **Technology briefs:** shipping, biogas, liquid biofuels and upcoming on electric-mobility
- **Greenhouse-gas emissions,** bioenergy analysis
- **Transport roadmap**

Innovation Technology Outlook of Advanced Biofuels

PROSPECTS FOR DEPLOYMENT IN THE NEXT THREE
DECADES



September 2015

Objectives

“ “ This study provides a global technology outlook for advanced biofuels from 2015 to 2045, specifically liquid transport fuels. ” ”

- Overview of market potential
- Comparative assessment of pathways
- Technology gaps and opportunities for R&D
- Non-technical gaps and opportunities for deployment
- Promising production pathways
- Commercialisation strategies

Report coming up in 2015

Advanced Biofuel Market Potential*

90 INNOVATIVE PROJECTS IDENTIFIED

46 projects in
North America

First commercial: 8
Commercial: 14
Demonstration: 11
Pilot: 21

29 projects in
Europe

First commercial: 7
Commercial: 9
Demonstration: 8
Pilot: 11
R&D: 1

9 projects in
Asia and Middle
East

Commercial: 1
Demonstration: 3
Pilot: 5

2 projects in
South America
(Brazil)

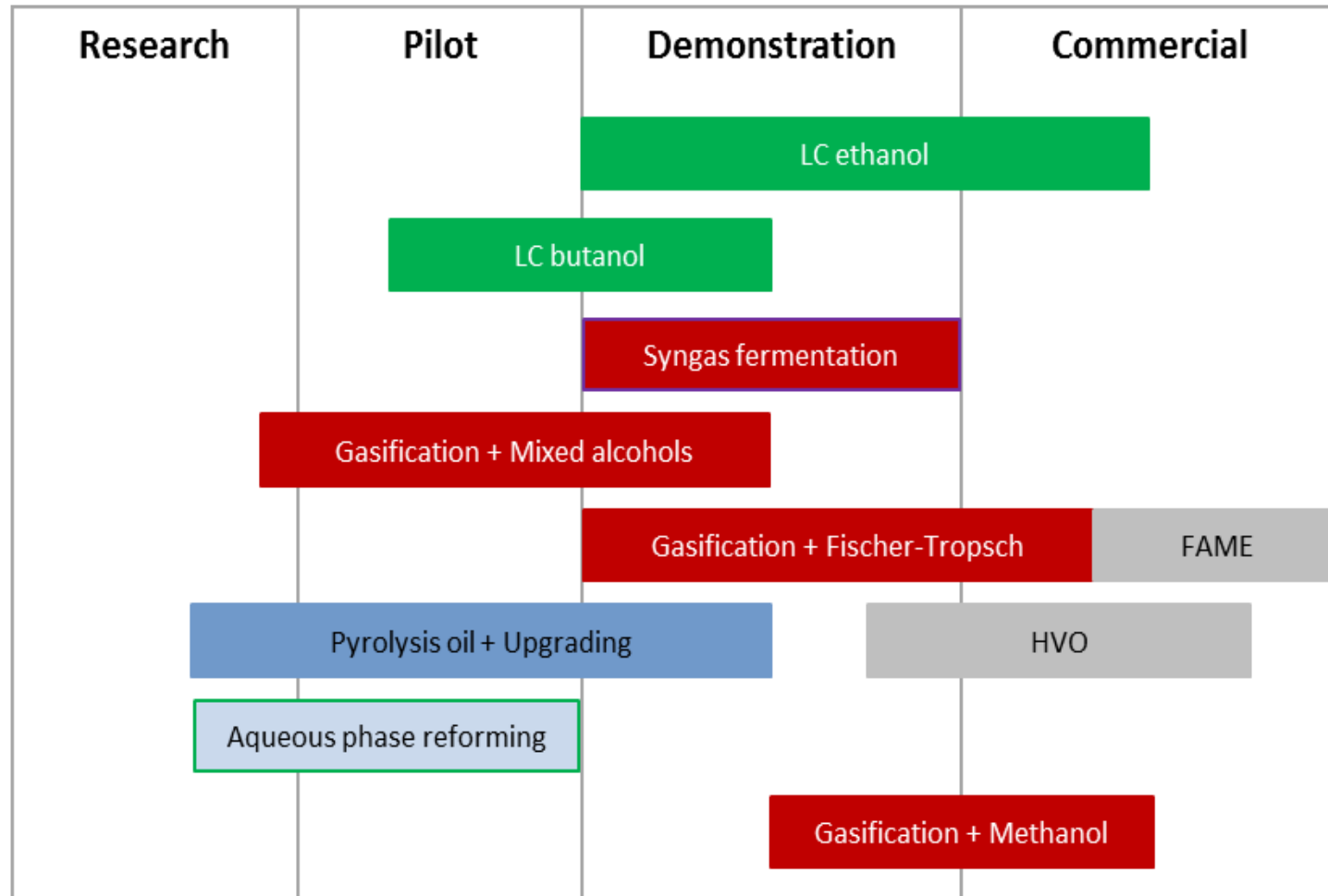
First commercial: 1
Commercial: 2

4 projects in
Oceania
(Australia)

Commercial: 1
Demonstration: 1
Pilot: 2

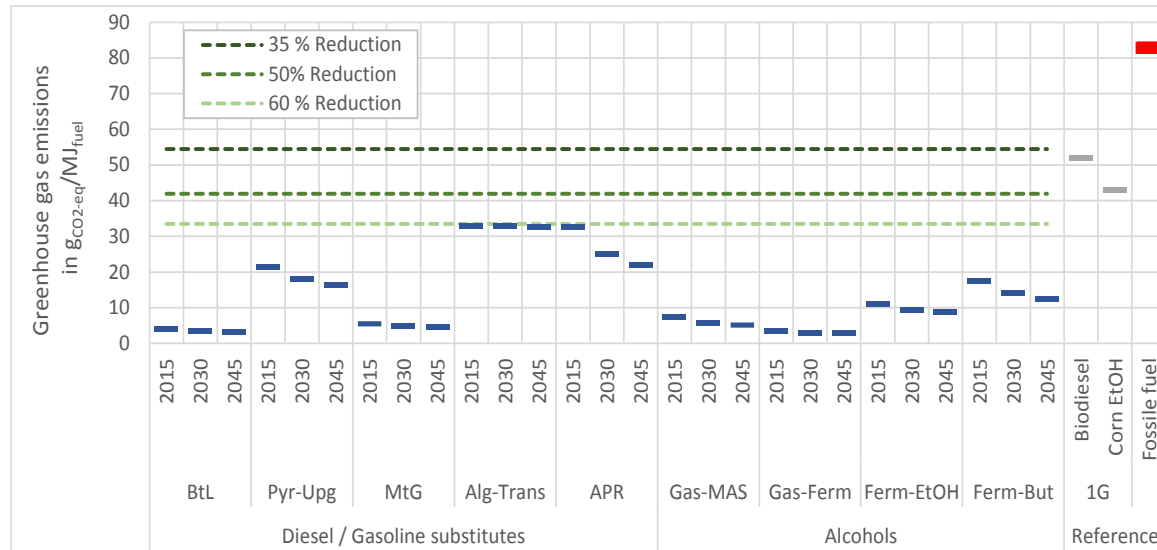
*Preliminary results

Advanced Biofuel Pathways



Conversion Technology Prospects*

All pathways achieve a 60 % GHG reduction compared to the RED fossil reference



*Preliminary results

Production costs

Feedstock: major share in most pathways

Specific capital investment:

- Drop-in fuels: lowest for pyrolysis and similar to gasification routes
- Ethanol: gasification pathways becoming competitive

Efficiency

Highest efficiency: Transesterification

Drop-in fuels: pyrolysis and pyrolysis oil upgrading

Ethanol: Syngas fermentation

Upcoming Research



- **What are the technology gaps in each pathway?**
- **What are the R&D opportunities arising from the technical gaps?**
- **How far has research gone to fulfill prospects?**

- **Policy and market access**
- **Financial**
- **Environmental**
- **Social**
- **Infrastructure and logistics**

- **Brokered partnerships**
- **Loan guarantees**
- **Loan softening programmes**
- **Project loan facility**
- **Standards, mandates, premium pricing tools**

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




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much for your
attention**

Thank you!

For more information about REmap 2030 please visit

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For questions about becoming part of the Transport
Action Team please email **remap@irena.org**