

# Opportunities for Co-location of Advanced Biofuels Production

Meghan Sapp

30 November 2017

# Clean Energy Solutions Center

CleanEnergySolutions.org

Finance.CleanEnergySolutions.org

The Clean Energy Ministerial launched the Clean Energy Solutions Center as a major initiative in 2011.

The Solutions Center:

- Helps developing governments design and adopt policies and programs and identify finance measures that support the deployment of clean energy technologies.
- Partners with 35+ international energy and finance organizations to provide a range of resources, from web-based information to webinars and trainings.
- Offers the **Ask an Expert** service, which connects governments with a global network of 50+ energy and finance experts for direct technical assistance to develop **solutions to policy and finance barriers** to clean energy.



Energy Efficiency      Energy Access  
Finance Mechanisms      Renewable Energy  
Smart Grid      Transportation      Utilities

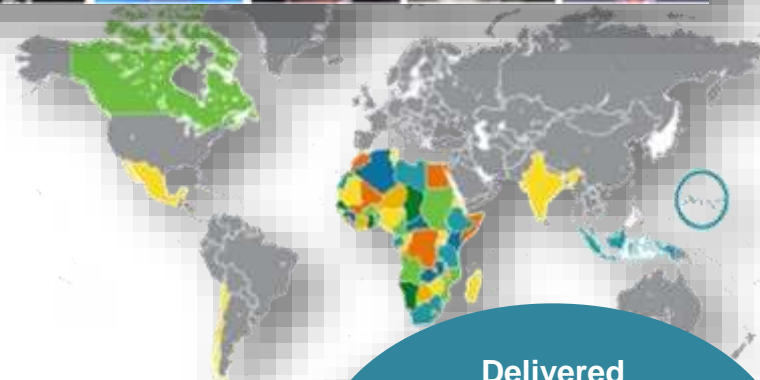
# Ask an Expert: Our Experts in Action

CleanEnergySolutions.org



## Benefits of the Ask an Expert Service

- **Quick** and **Easy** access to assistance.
- **No cost** for assistance and no commitment.
- **Objective** assistance from experts is **personalized** to help governments meet local clean energy goals.
- **High-quality** assistance includes:
  - Access to a **collaborative network** of over 50 vetted, international experts with authority on clean energy policies and financing.
  - Independent **review** of assistance to ensure quality.



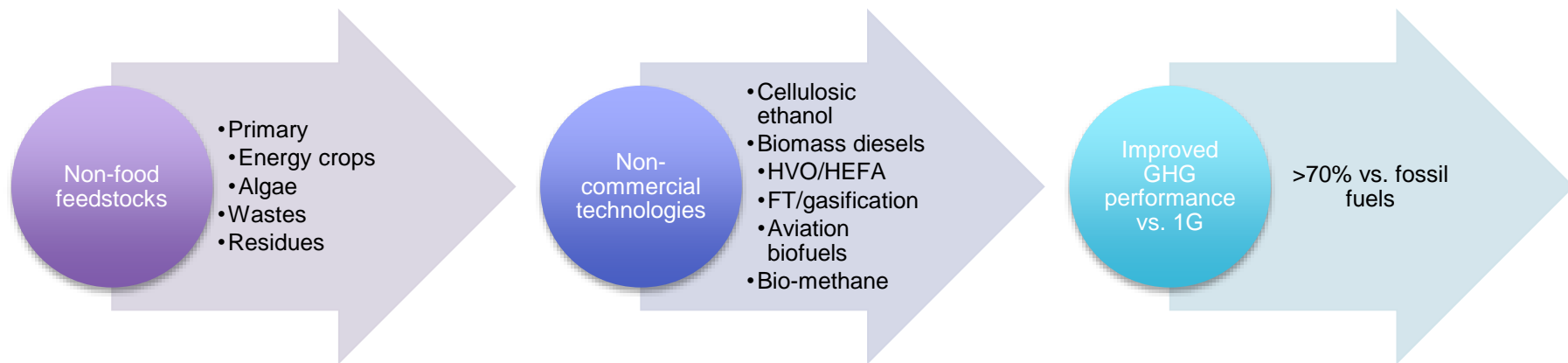
Delivered  
no-cost assistance  
for more than 250  
requests from over  
100  
countries/regions.

To request assistance, go to  
[cleanenergysolutions.org/expert](https://cleanenergysolutions.org/expert)

## Expert support available to developing countries

- Request can come from staff or officials at all levels of government – national, regional, local.
- Service also supports organizations working with governments.

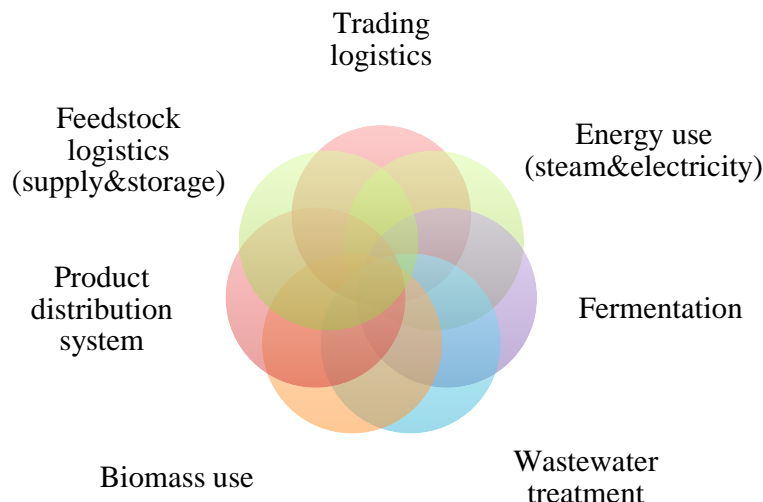
# Advanced Biofuels



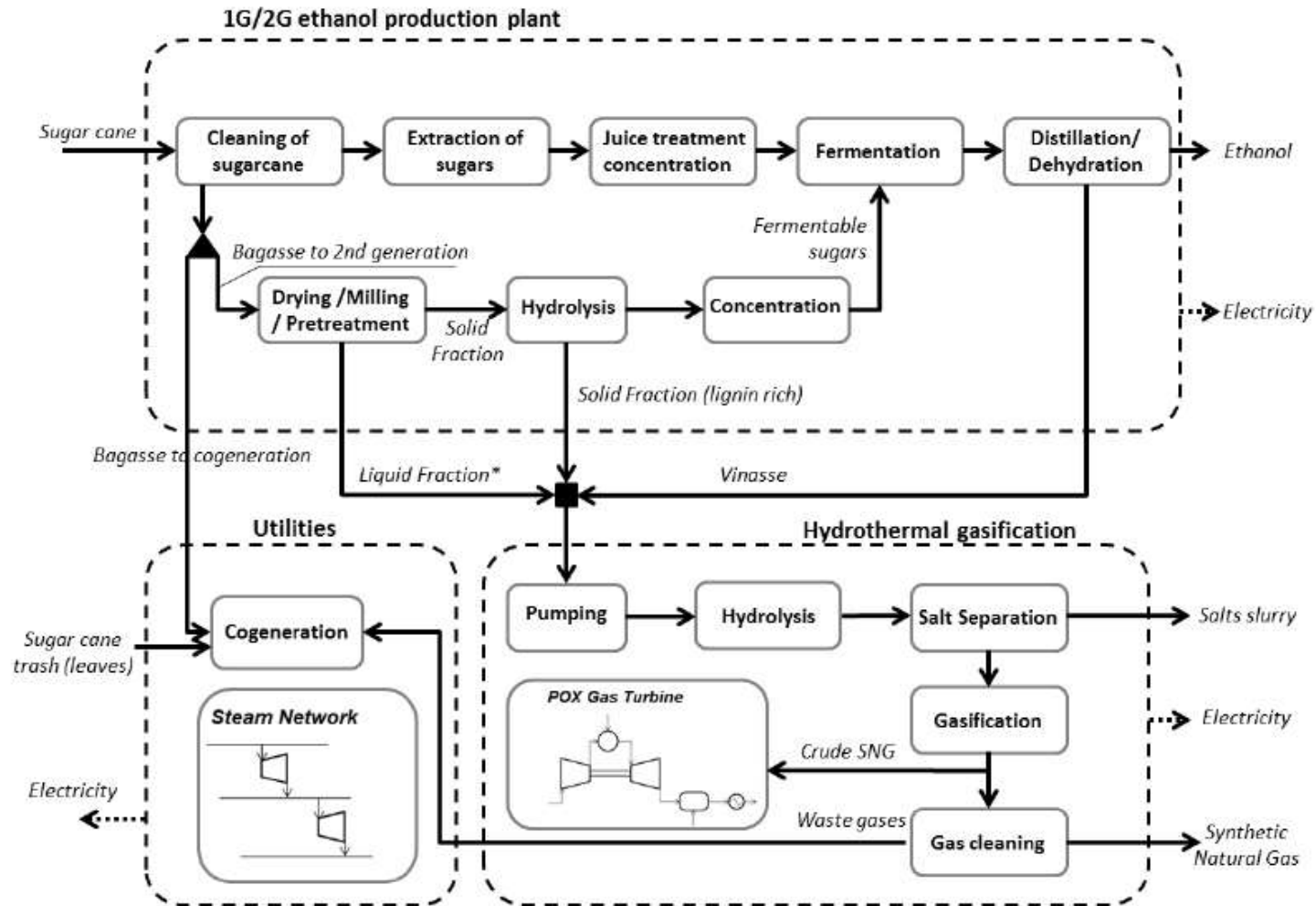
# Co-Location of Advanced Biofuels

## *Opportunities*

- Some technologies already proven
  - Speeds up learning to get technologies to market
- Lower capex=reduced risk, faster implementation
- Extensive synergies with 1G, heavy industry & oil refineries

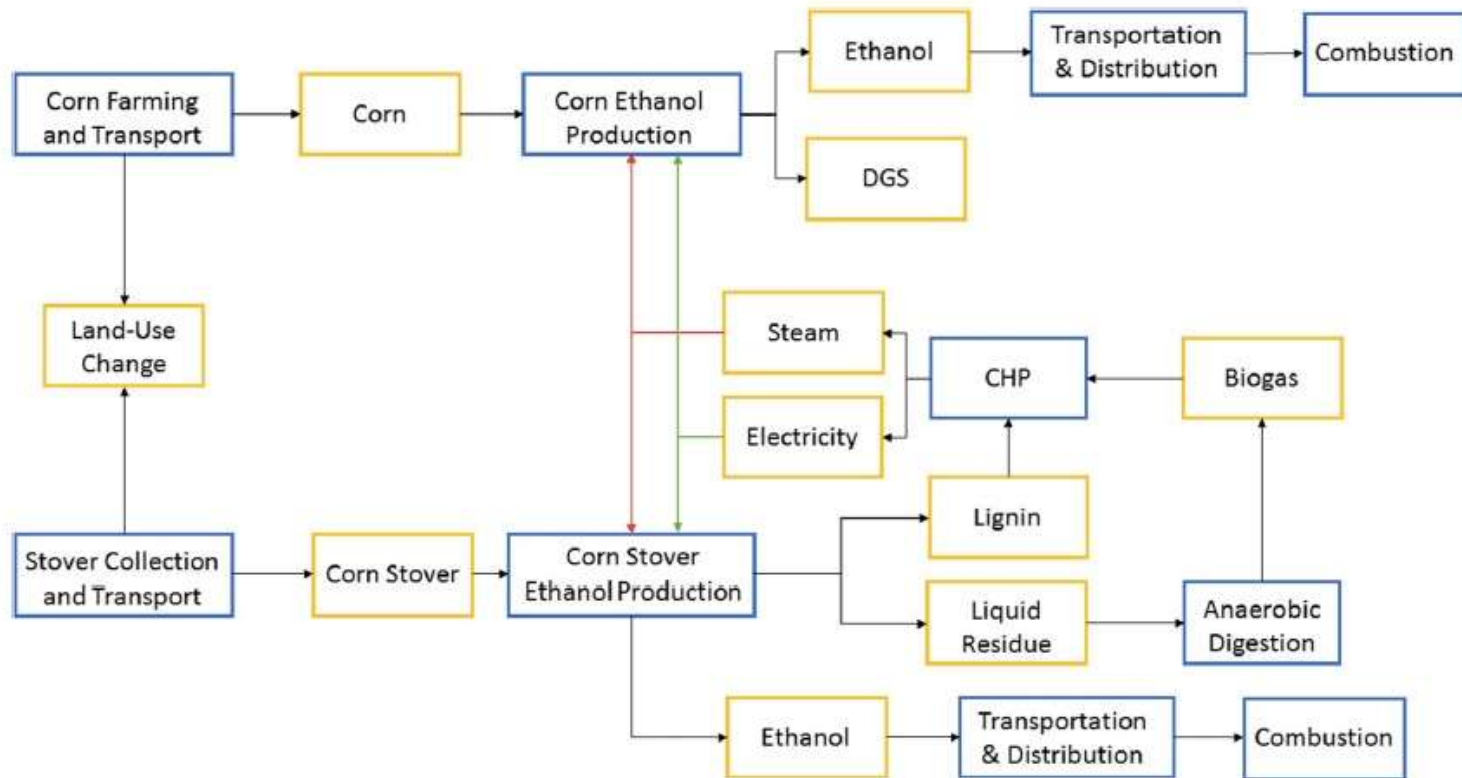


# Examples of Co-Location



Source: Mian et al 2014

# Examples of Co-Location



Source: Canter et al 2016

# Co-Location of Advanced Biofuels

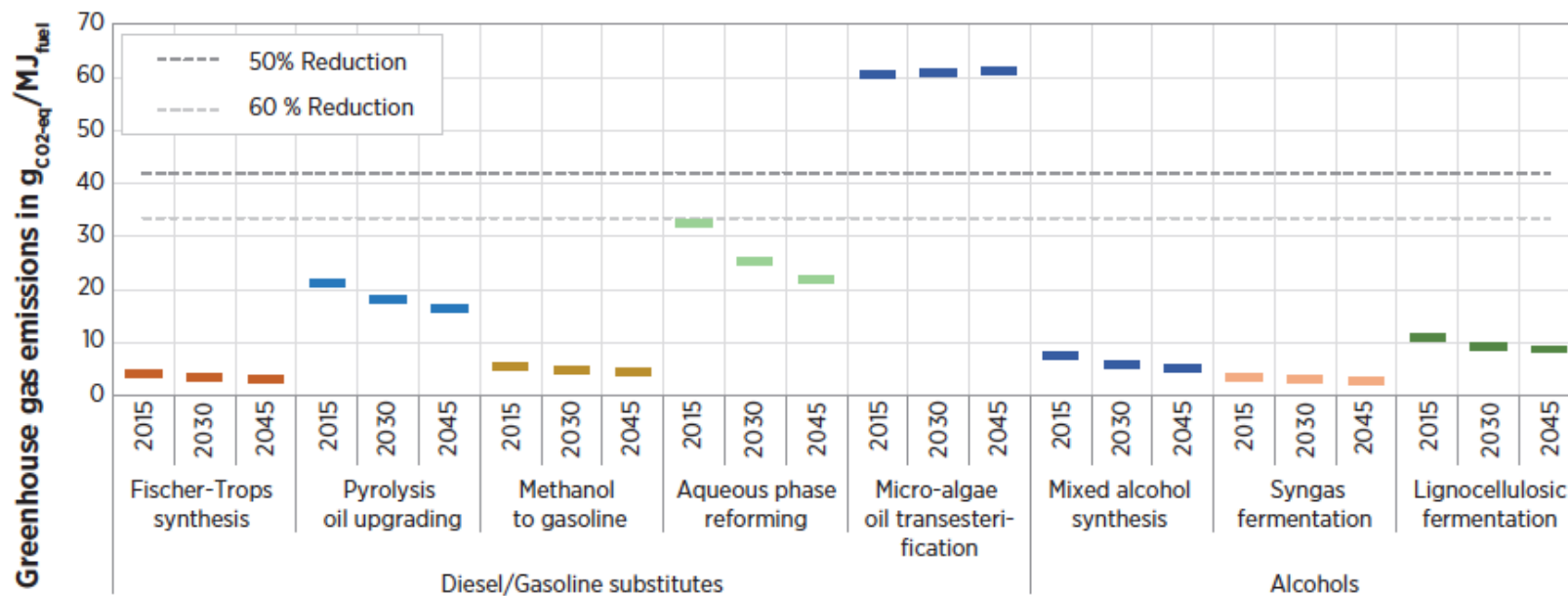
## *Challenges*

- Key 2G challenges remain
  - Feedstock supply chain
  - Expensive & complicated technology
  - Higher energy costs
- Few opportunities to co-locate biodiesel with 2G
- Sustainability
  - Land use requirements/LUC
  - Resource competition
  - Soil health



# Co-Location of Advanced Biofuels

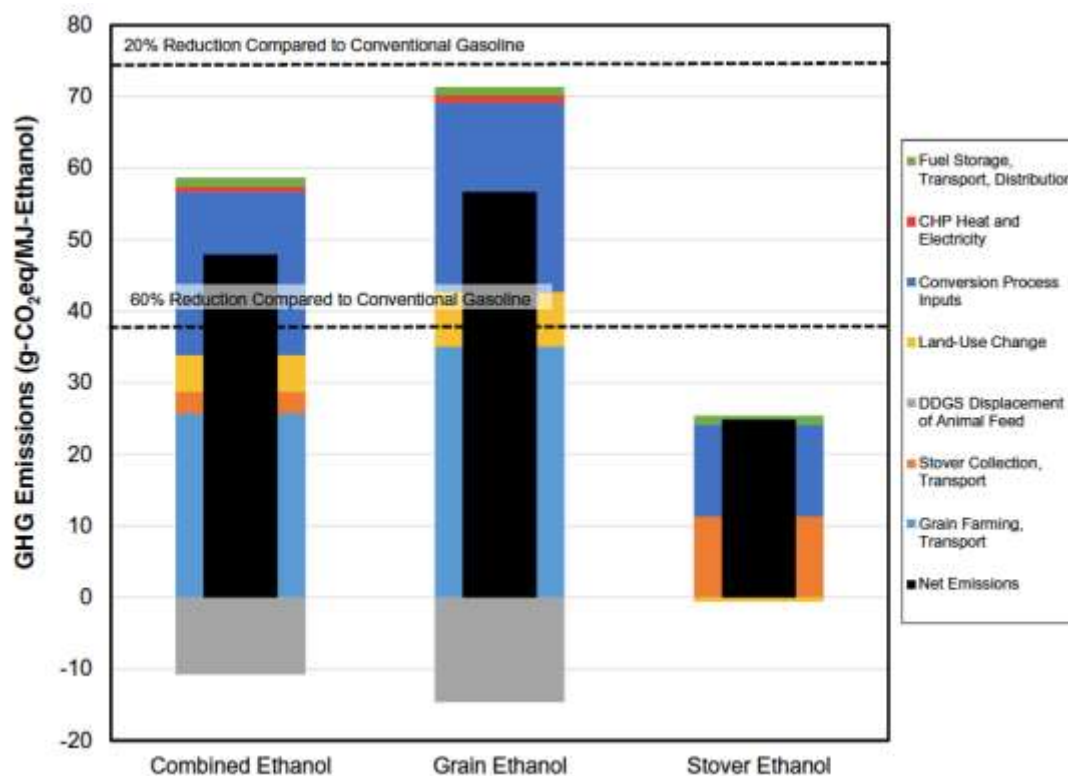
## Sustainability



Source: IRENA 2016

# Co-Location of Advanced Biofuels

## Sustainability



Source: Canter et al 2016

# Co-Location of Advanced Biofuels

## Policy

- Long-term policy support required: **10 years min.**
  - Even where policies like RED and RFS exist, still policy uncertainty

Policy design principle	Renewable energy Mandate	GHG reduction Target	Price-guarantee	Fuel tax reduction/production tax credit	Investment tax credit	Grants and loan guarantees
Long-term support	Binding mandate for at least 10 years		Contracts for at least 10 years	Duration of at least 10 years	Duration of at least 5 years	N/A
Avoid competition with first-generation biofuels	Separate target for AAF			Dedicated fund for AAF		
Deal with sustainability up front	Accounting for indirect emissions and other environmental concerns in policy design			Eligibility restriction to sustainable fuels		
Support offtake	Requirement for fuel suppliers to supply/blend fuel			Government offtake contracts		
Cost containment	Credit price ceiling and potentially floor		Maximum reimbursement	Tax credit phase out after certain volume achieved		Set amount of funding available

Source: Bitnere et al 2017

# Co-Location of Advanced Biofuels

## *Policy*

- Integrate policies supporting co-location into existing AB policy structures
  - Requiring industries to reduce carbon intensities (pulp&paper, oil)
  - Direct investment incentives
    - Ej. financing schemes, tax exemptions and low-interest rate loans
  - Biorefinery policies and investment schemes
  - Demonstration of bolt-on technologies to speed up learning
    - Ej. pyrolysis, FT, etc.
  - Awareness raising and capacity building: spread the word!

Source: Bitnere et al 2017

# GRAZIE!

For more information, please contact:

Meghan Sapp [meghan@planetenergynow.com](mailto:meghan@planetenergynow.com)

Victoria Healey [victoria.healey@nrel.gov](mailto:victoria.healey@nrel.gov)