



# The Emerging International Consensus on Bioeconomy Benefits

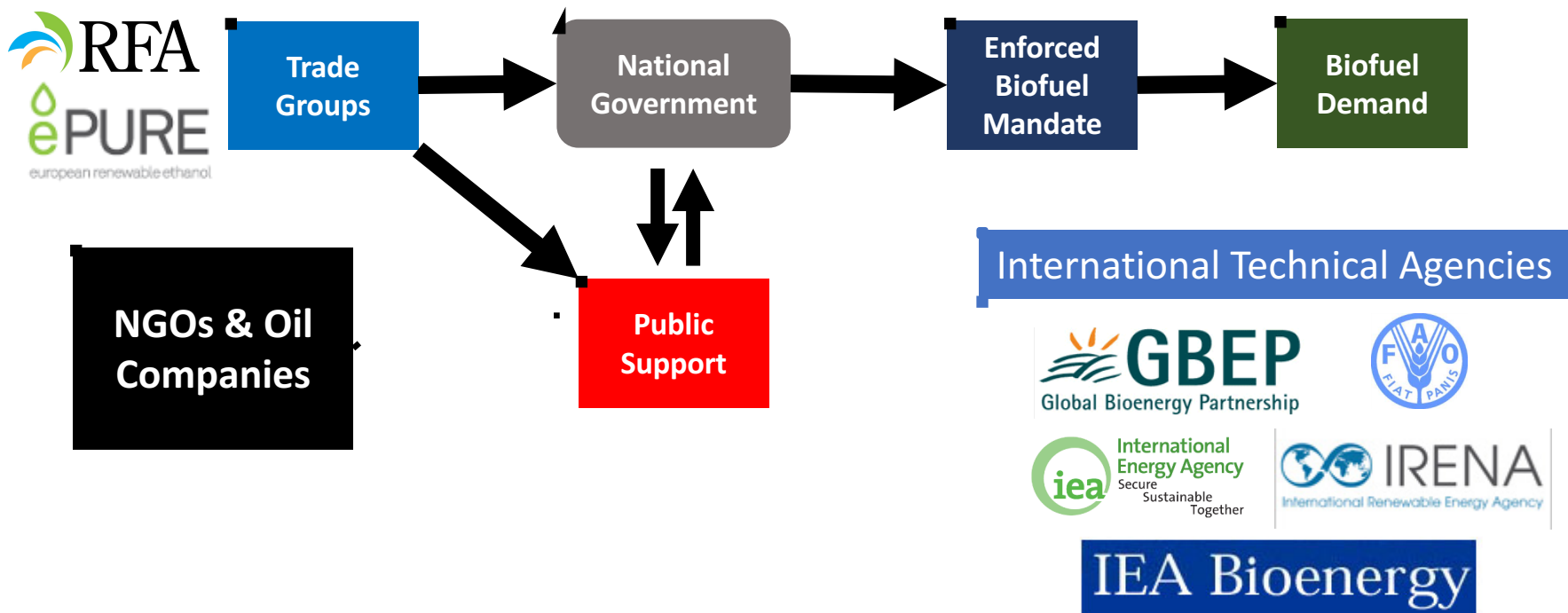
**DOE Bioeconomy 2017**

12 July 2017

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Sustainable Energy for All

# Biofuels Policy Ecosystem from 2008 to 2015

- Demand was almost entirely policy driven.
- Producers and trade groups were the primary policy advocates.
- The international RE policy environment was typically hostile to biofuels from NGO input.
- International Technical Agencies were **NOT** connected to national policy development.



# GBEP Indicators of Sustainable Bioenergy Production and Use

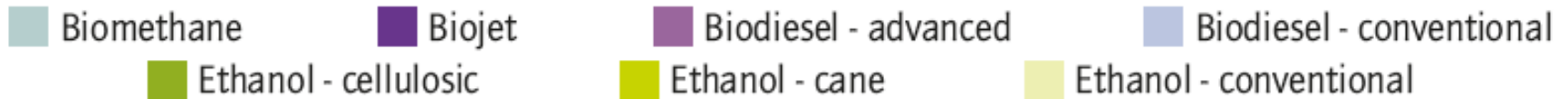
- Consensus reached in 2011
- Applied in numerous countries since
- Learning that it is hard to get the needed data



# The International Energy Agency (IEA) has spoken strongly in favor of Low Carbon Fuels for years . . .



Technology Roadmap  
Biofuels for Transport



- Global biofuel supply to grow from 2.5 EJ today to 32 EJ in 2050
- Biofuels share in total transport fuel increases from 2% today, to 27% in 2050
- Diesel/kerosene-type biofuels are particularly important to decarbonise heavy transport
- Large-scale deployment of advanced biofuels is vital to meet the roadmap targets



# Sustainable Energy for All – Leading the effort to sustainable, low carbon future.

The UN Secretary General and the World Bank President created SE4All in 2012 for:

**Ban-Ki Moon**  
*Secretary General*  
United Nations



**Jim Yong Kim**  
*President*  
World Bank



Ensuring universal  
**Energy Access**



Doubling the share of  
**Renewable Energy**



Doubling the rate of  
improvement in  
**Energy Efficiency**

In 2015 the SE4forAll mission was incorporated in to the Sustainable Development Goals as SDG7:

*“Ensure access to affordable, reliable, sustainable and modern energy for all”.*



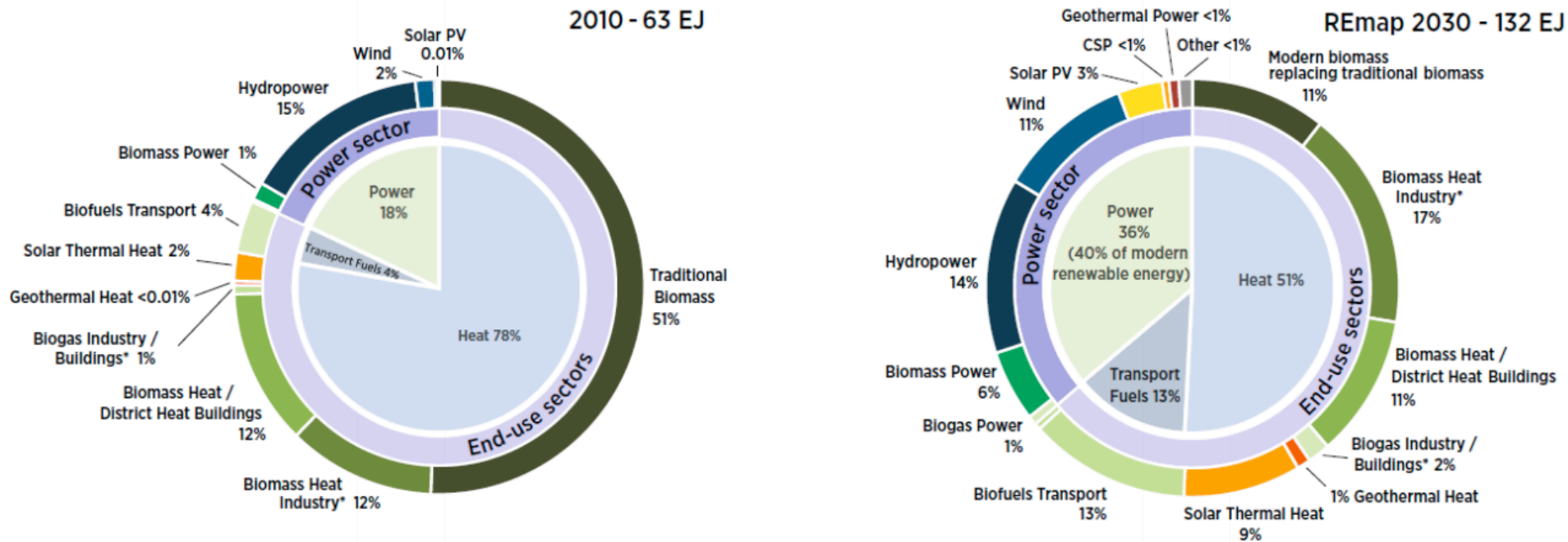
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- IRENA's 2014 Remap 2030 expects biomass to contribute 60% to doubling the use of renewables

## Global renewable energy use by technology and sector, 2010 and in REmap 2030



**Sustainable Bioenergy is needed to substitute for fossil fuel use in the HEAT, POWER and TRANSPORTATION sectors.**

# MISSION INNOVATION launched in 2015 during COP21 in Paris



## MISSION INNOVATION

In Paris at COP21 20 countries committed to reinvigorate global efforts in clean energy innovation;

## GOALS

- Develop and scale breakthrough technologies that promise substantial cost reductions.
- Double public clean energy research and development investment over five years.

## INNOVATION CHALLENGES

- Calls to action to accelerate research, development, and demonstration (RD&D) in 7 technology areas.
- Strikingly, one of the 7 is the [Sustainable Biofuels Innovation Challenge](#) that seeks to **develop ways to produce, at scale, widely affordable, advanced biofuels for transportation and industrial applications.**

## *Breakthrough Energy Coalition Launches US\$ 1 Billion Clean Energy Fund*

December 12, 2016 The [Breakthrough Energy Coalition \(BEC\)](#)—a group of entrepreneurs, business leaders, and institutional investors committed to help bring promising new zero-emissions energy technologies to market—has announced a commitment to invest more than US\$ 1 billion in a fund called [Breakthrough Energy Ventures \(BEV\)](#).



# BIOFUTURE PLATFORM LAUNCHED AT COP22 (2016)



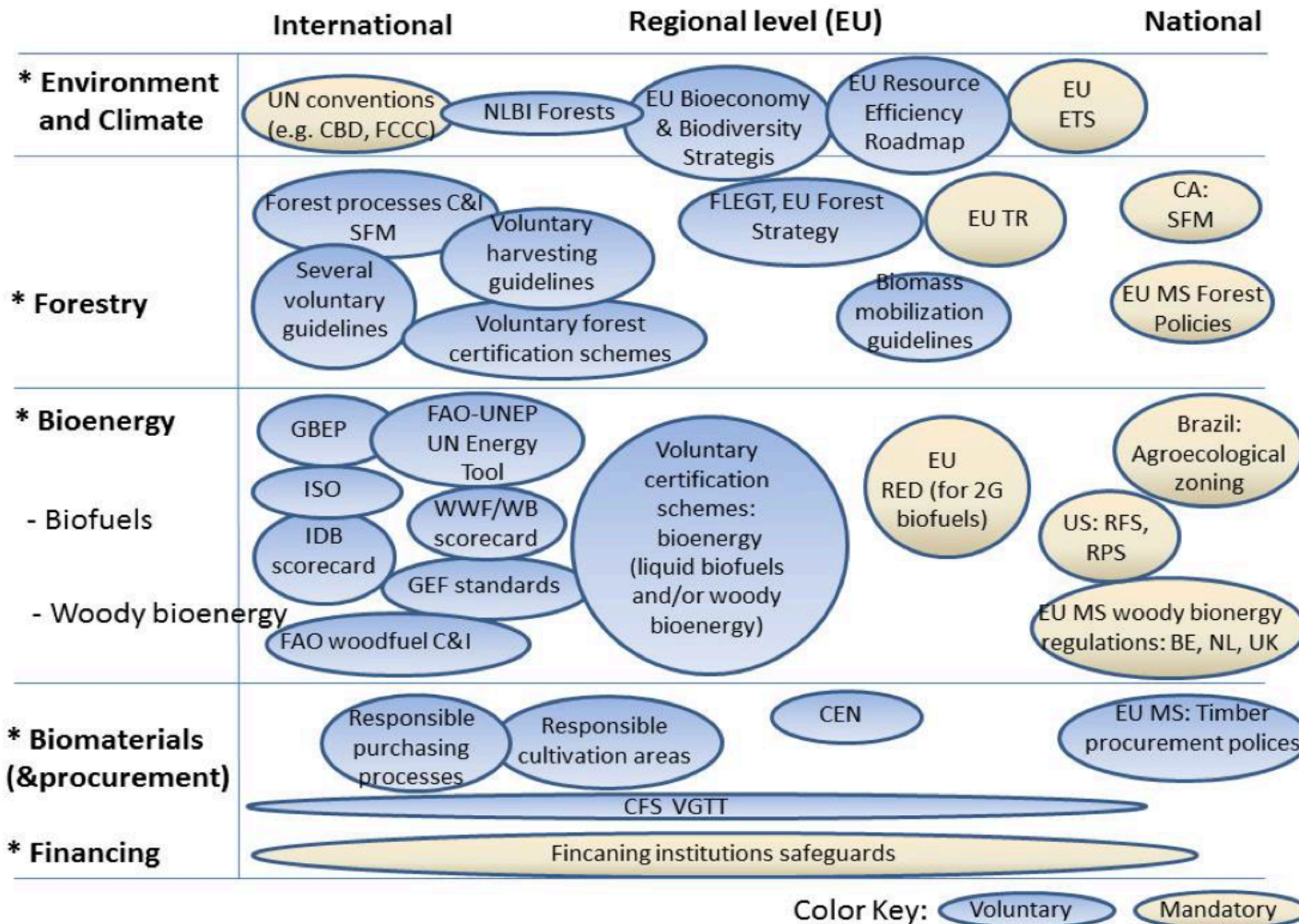
Twenty countries launched the Biofuture Platform to help

- Grow the Global Bioeconomy &
- Decarbonize transport and industry through advanced low carbon fuels solutions.

- The Government of Brazil, including BNDES, seeks to promote biomass-derived fuels and chemicals by helping mature and emerging markets develop their cellulosic resources.
- The Biofuture Platform is a useful new **government-to-government** dialog (as opposed to a public-private partnership)
- **SEforAll > below50 are partners** and coordinate efforts between the public and private sector.
- It is significant that countries like **Brazil, China and India will advocate** for Low Carbon Fuels.



# The Biomass Sustainability space has grown quite dense since 2008.

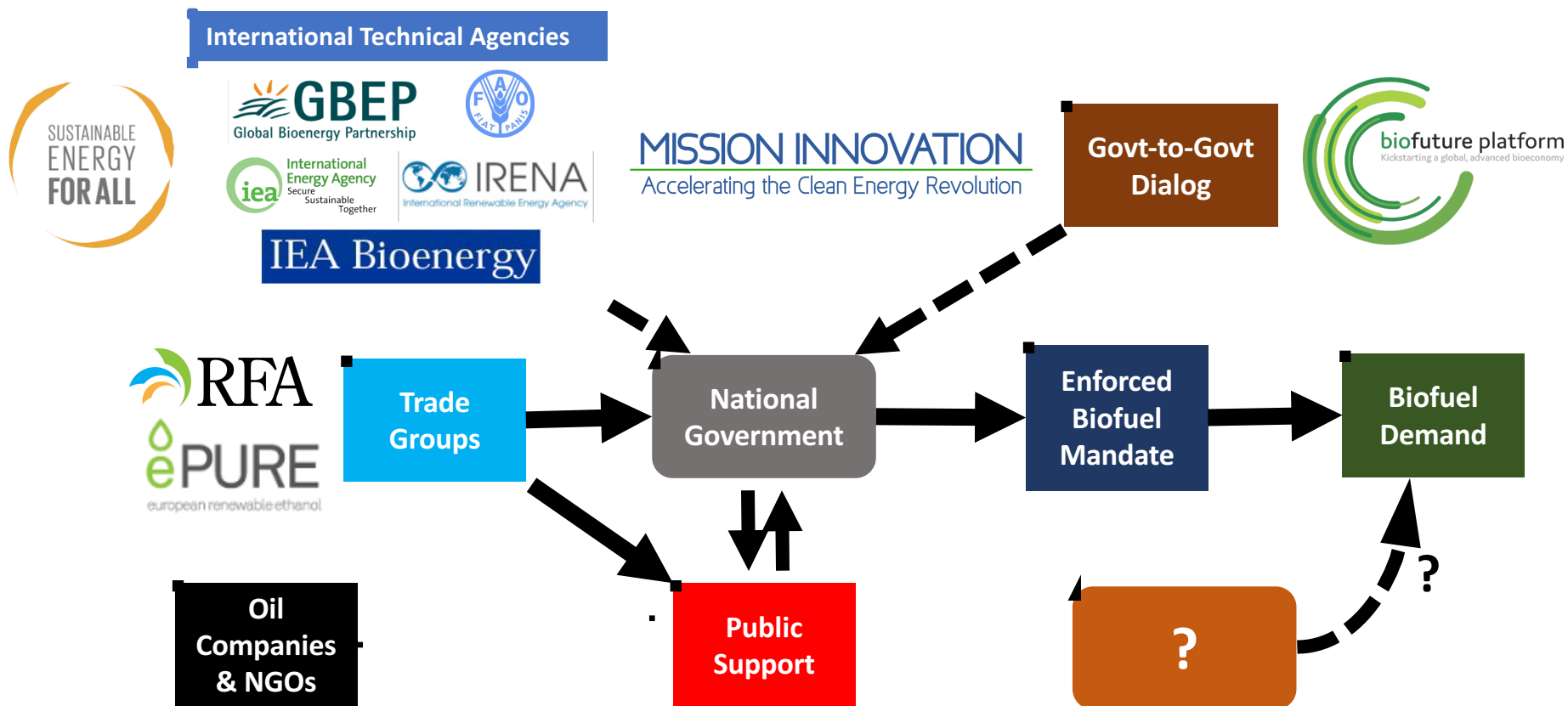


→ Need to harmonize sustainability requirements across sectors

# New Bioeconomy Policy Ecosystem

Better policies and R&D can facilitate supply, **BUT**

- How to grow demand not dependent on government mandates?
- How to truly unleash market forces to drive innovation?





# Sustainable Bioenergy Accelerator: Partnering for Growth

The Accelerator is a not-for-profit, voluntary association that supports SEforAll and thru

- Knowledge enhancement and information sharing;
- Policy and sustainability support; and
- Deployment support.

The Group fosters **Public-Private Partnerships** that will encourage the sustainable production and use of

- Biopower from Agriculture Residues and Municipal Solid Waste;
- On-farm bioenergy for increased Agricultural Productivity; and
- Low Carbon Fuels for Aviation and Road Transport.

***Novozymes created and has sponsored the Sustainable Bioenergy Accelerator to meet the goals of SEforALL.***



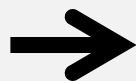
# Below50 - Growing the Global Market for the World's Most Sustainable Fuels



PUBLIC



PRIVATE



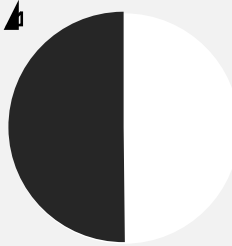
MARKETS



INVESTMENT



below50 fuels



Less than 1/2 CO2 emissions of fossil fuels



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# below50 – Enabling the uptake of Low Carbon Fuels

- Convert the **global momentum on climate action** into national level policies, i.e. link Low Carbon Fuels to the NDCs
- Create cross-sectoral **B2B opportunities in new & mature markets** throughout the supply chain
- Host regional dialogues in key markets to **engage with investors and financiers** to address investment barriers
- Create demand for below50 fuels by **recruiting corporate fuel buyers**



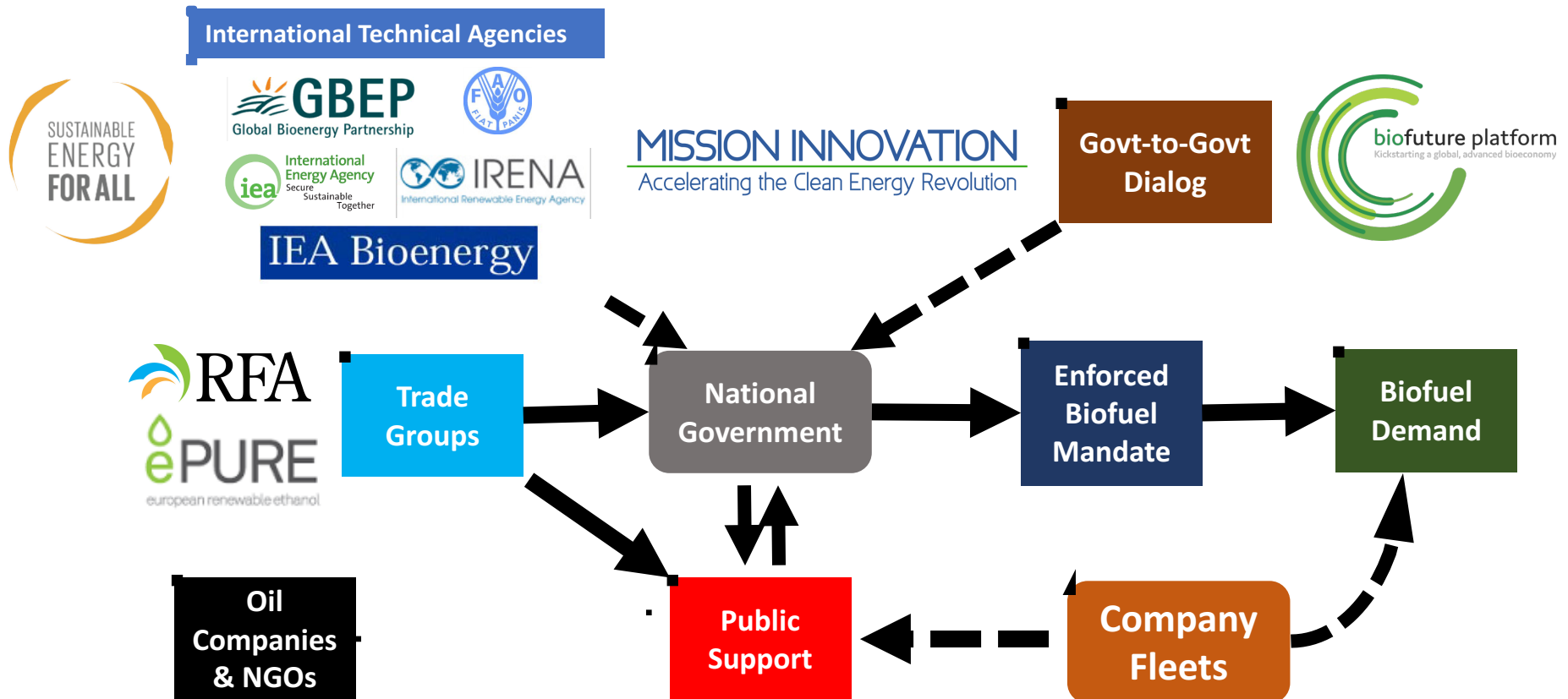
Movement



Action

# Direct Corporate Fuel-Buying could augment demand and foster investment in the bioeconomy

- Companies are de-carbonizing their operations.
- Airlines have been leading the way. Can we translate their work to road freight?



## Bioenergy for Sustainable Development

**Three Global agencies are calling on nations to use Bioenergy to achieve the UN Sustainable Development Goals (SDGs).**

Bioenergy typically enhances regional energy access and reduces reliance on fossil fuels, and it can

- Vitalize the forestry and agriculture sectors;
- Contribute to our global climate change mitigation goals
- Support other important social and environmental objectives.

**Three key concerns are**

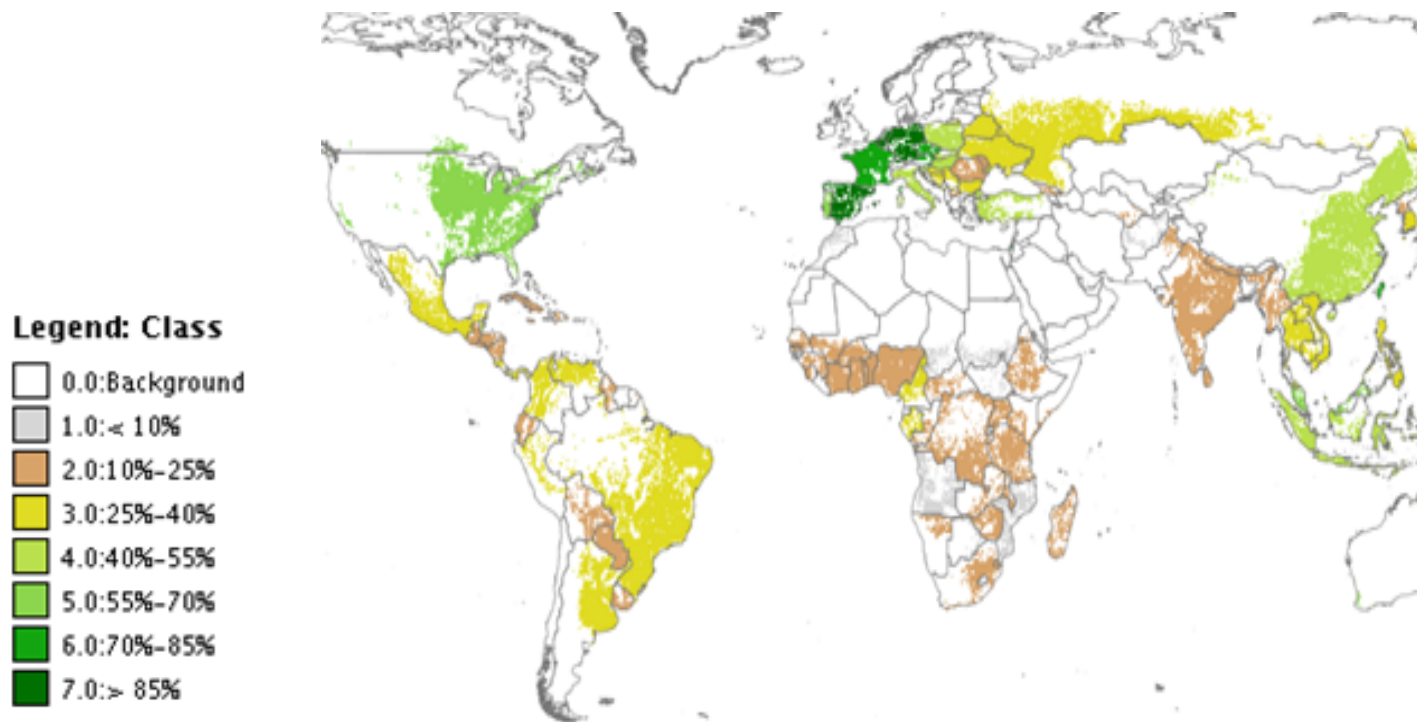
- Food security;
- Risks that land use and land use change from bioenergy expansion may increase carbon emissions or reduce biodiversity; and
- Becoming cost-competitive with fossil fuels.

**Bioenergy need not compete with food security** due to the potential to

- Increase agricultural yields;
- Convert of pasture land; and
- Restore degraded landscapes.

## Increasing ag yields will boost biomass and starch production

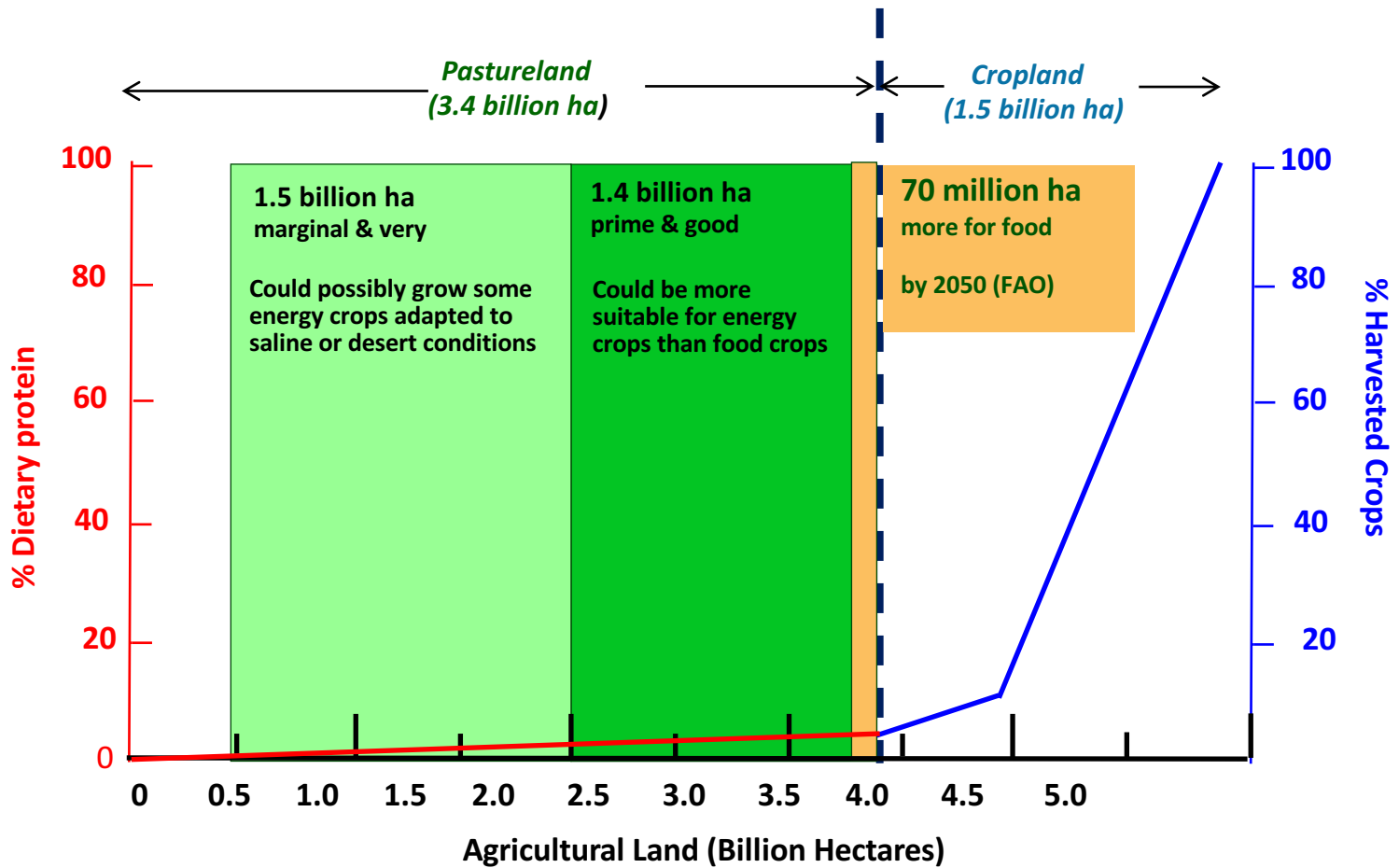
*Ratio of Actual to Potential Yield for Maize (Year 2000)*



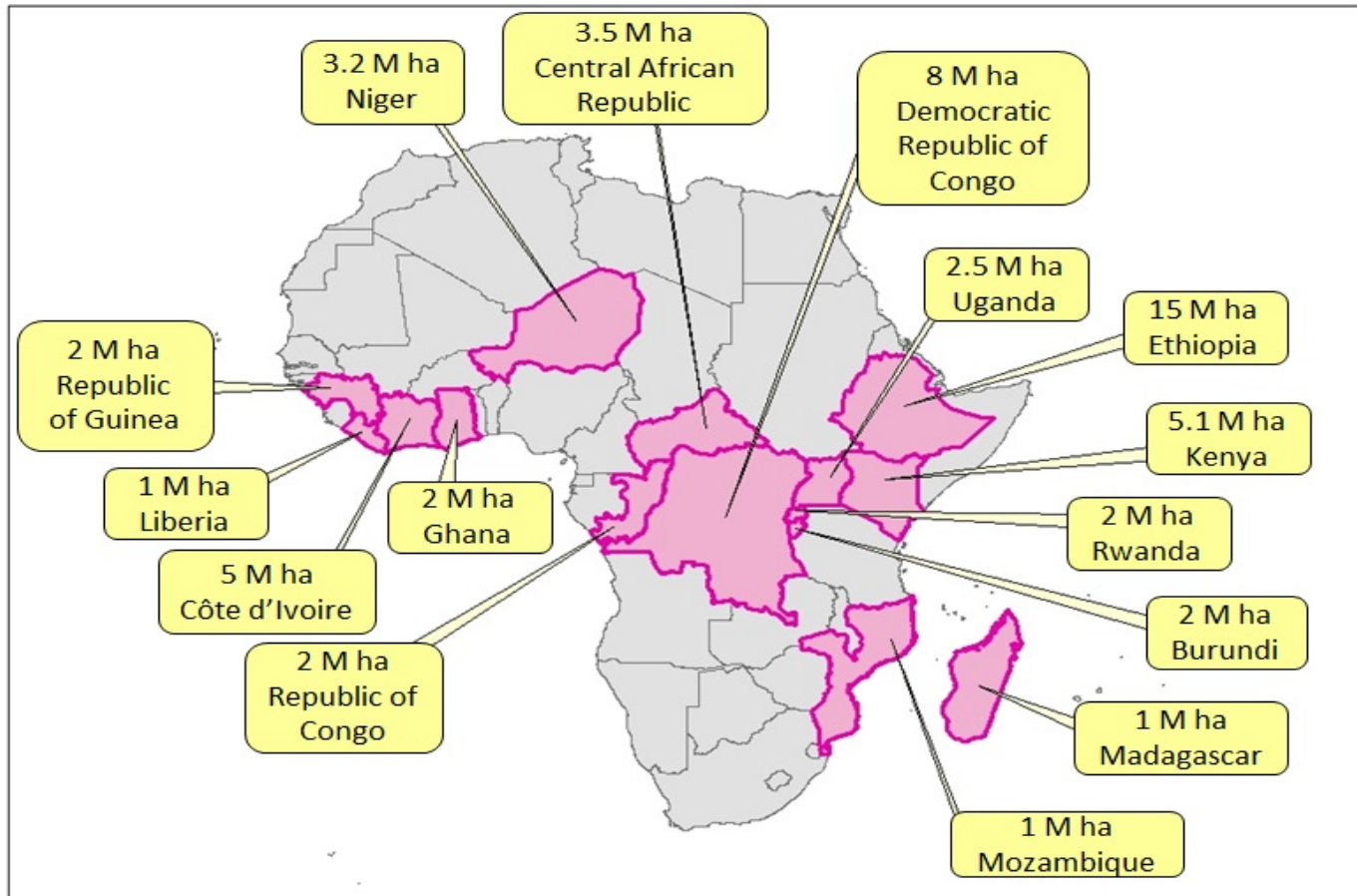
Source: Global Agro-Ecological Zones



### Pastureland can be converted into cropland for Food and Fuels



### Degraded land can be converted into cropland for Food and Fuels



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[below50.org](http://below50.org)

**below, bescience, bebetter, beinnovation**