The Emerging International Consensus on Bioeconomy Benefits

DOE Bioeconomy 2017

12 July 2017

Gerard J. Ostheimer, Ph.D.
Global Lead for Sustainable Bioenergy
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 . . .

- 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

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”.

DOE Bioeconomy 2017
11 July 2017
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
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).
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.

Twenty countries launched the Biofuture Platform to help
- Grow the Global Bioeconomy &
- Decarbonize transport and industry through advanced low carbon fuels solutions.
The Biomass Sustainability space has grown quite dense since 2008.
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?
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.**

Co-Chairs:
Below50 - Growing the Global Market for the World’s Most Sustainable Fuels

PUBLIC

PRIVATE

MARKETS

INVESTMENT

below50 fuels

Less than ½ CO2 emissions of fossil fuels

DOE Bioeconomy 2017
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**
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

- Pastureland (3.4 billion ha)
- Cropland (1.5 billion ha)

- 1.5 billion ha marginal & very
  - Could possibly grow some energy crops adapted to saline or desert conditions

- 1.4 billion ha prime & good
  - Could be more suitable for energy crops than food crops

- 70 million ha more for food by 2050 (FAO)

% Dietary protein
% Harvested Crops

Agricultural Land (Billion Hectares)
Degraded land can be converted into cropland for Food and Fuels