Achievement in Outdoor Microalgae Oil Cultivation and R&D at TISTR AEC

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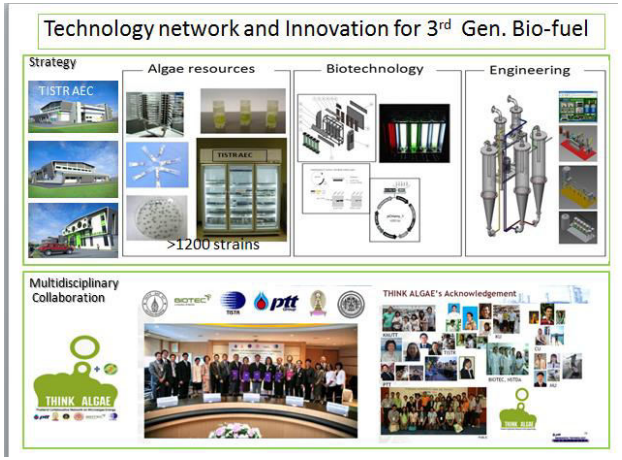
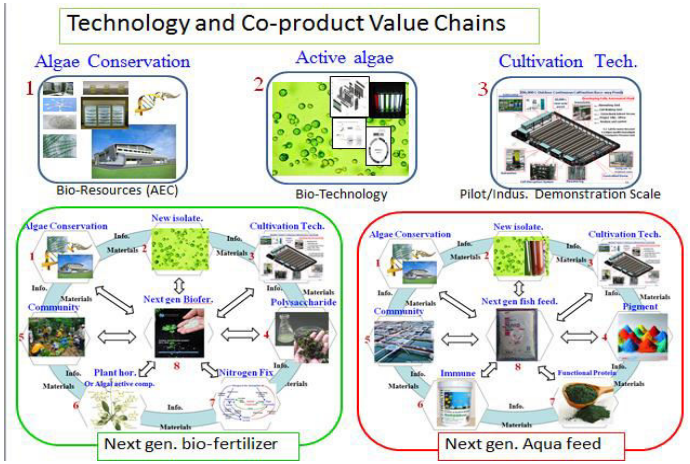
Scope

How we work?



Things we deliver?



Why we work?

What we have?

TISTR Algal Excellent Center (TISTR AEC)

Vision: To be the excellent center in regional recognition

Total Budget: 250 MB (~8.0 MUSD)

TISTR ACC / TISTR Algal Research Resources Center (TISTR ARRC)

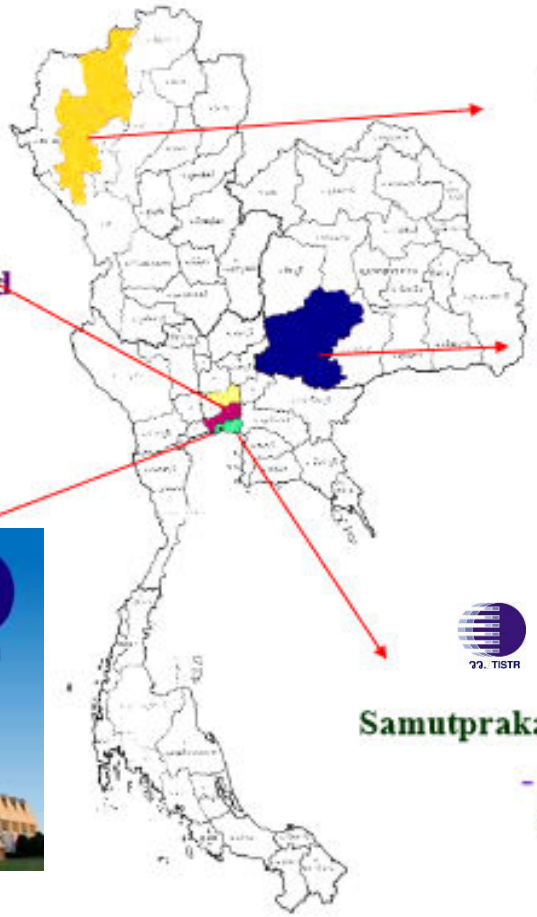
Freshwater & marine microalgal researches and utilizations

Who we are?

Training Program on Production Upgrading and Value Creation for SMEs and Micro-enterprises

31 Oct – 11 Nov 2016
Bangkok, Thailand
Thailand Institute of Scientific and Technological Research (TISTR)

Location



Chiangmai
-R&D at Doi Pui

Pathumthani
- R & D
-Material Properties Analysis and Development Centre
-Microbes Centre
(Bangkok MIRCEN, UNESCO)

Nakhon Ratchasima
- Sakaerat Environment Research Station
(UNESCO-Biosphere Reserve)
- Lam Takhong Research Station

Samutprakarn
- Industrial Metrology and Testing Service Centre

BSD

Bioscience Department

TISTR's Background

- Established in 1963
- Non-profit state enterprise
- Ministry of Science and Technology
- Initiate and conduct R&D and provide S&T service for industries

TISTR's Integrated R&D on Freshwater Microalgae
from up-stream (ACC) to down stream (product, process, innovation)

Unstable earth and Sustainable energy development approaches

UN sustainable development summit, New York, 2015

Global Carbon Footprint by nations

http://www.sustainabilityscientific.com/130331/global-carbon-footprint

Commitment

Significant Global Agreement in 2015 (1/2)

1972 — UN Conference on the Human Environment (Stockholm, Sweden)
- Our Common Future

1992 — UN Conference on Environment & Development (UNCED) (Rio de Janeiro, Brazil)
AKA: The Earth Summit or The Rio Conference
- UNFCCC
- UNCBD
- UN Declaration
- Agenda 21

2000 — UN Millennium Summit (New York City, USA)
- MDGs (8 goals) (2001-2015)

2002 — The Rio+10 (Johannesburg, South Africa)
- Johannesburg Declaration
- Johannesburg Plan of Implementation

2012 — The Rio+20 (Rio de Janeiro, Brazil)
- The Future We Want
- Green Economy

2015 — UN Sustainable Development Summit (193 countries) (New York City, USA)
- Transforming Our World: The 2030 Agenda for SD
- SDGs (2016-2030) 17 goals 169 targets

25 Sep.

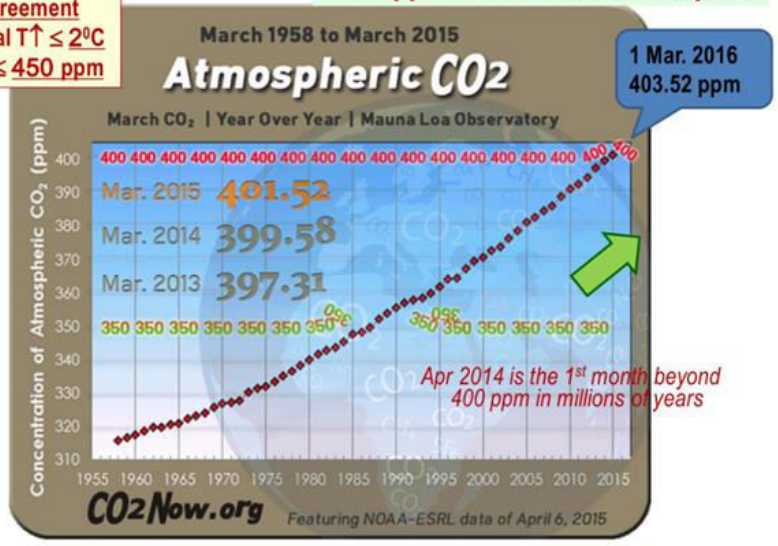
Ref.: NESDB(18 Dec.2015)

MDG ⇨ SDG

Unsustainable Earth

Agreement
Global T↑ ≤ 2°C
CO_2 ≤ 450 ppm

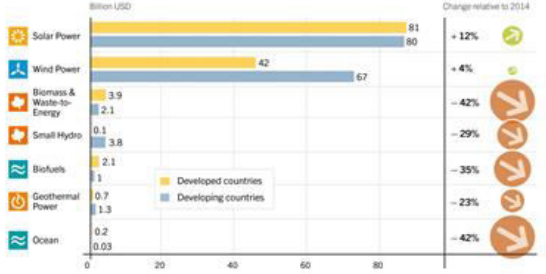
350 ppm in 1985 & 400 in Apr14



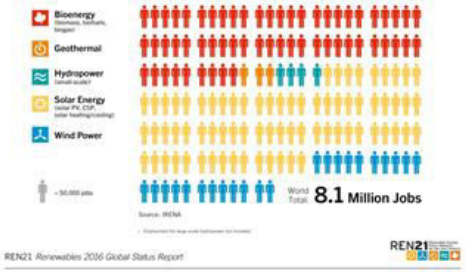
Global trends

http://www.thegreenmechanics.com/2014_01_01_archive.html

Global New Investment in Renewable Energy by Technology, Developed and Developing Countries, 2015



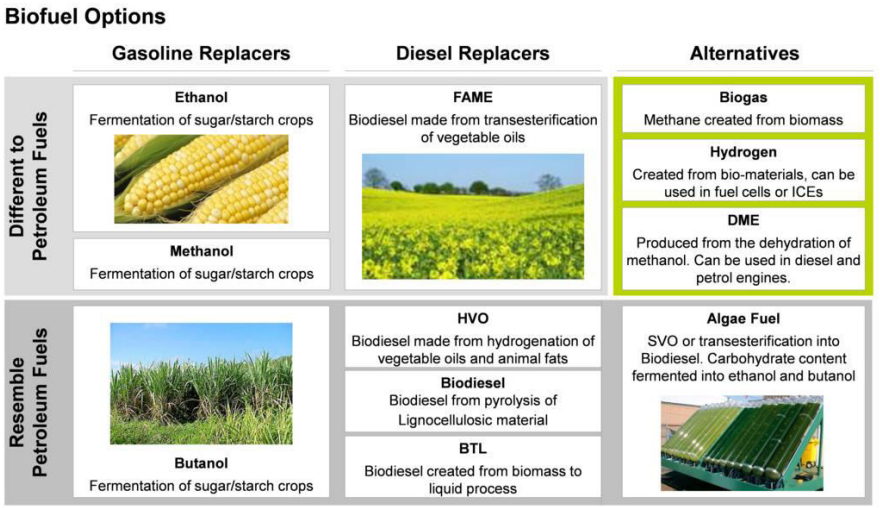
http://greenenergy.blogspot.com/



Regional/Thailand trends

Sustainable Future through Technology and Innovation

http://www.slideshare.net/htk999/20160224-bioeconomy-242559



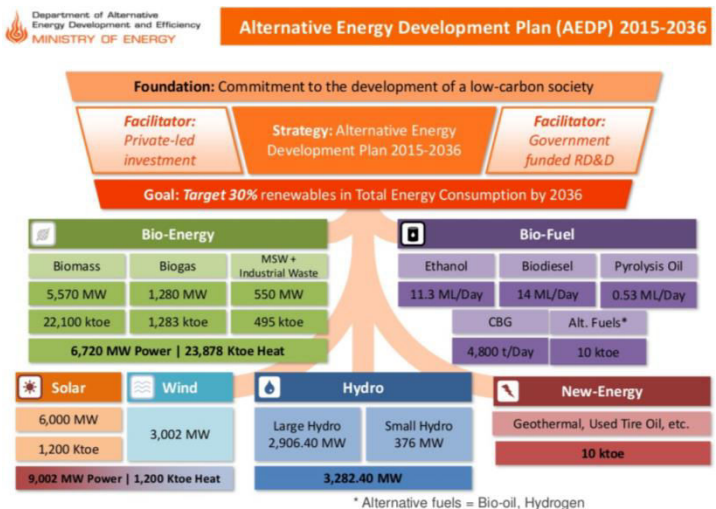
http://www.forconstructionpros.com/magazine/et/issue/2015/apr

Technology

- → Industry
- → Health
- → Food security
- → Climate protection
- → Environment protection
- → Energy supply

Economy

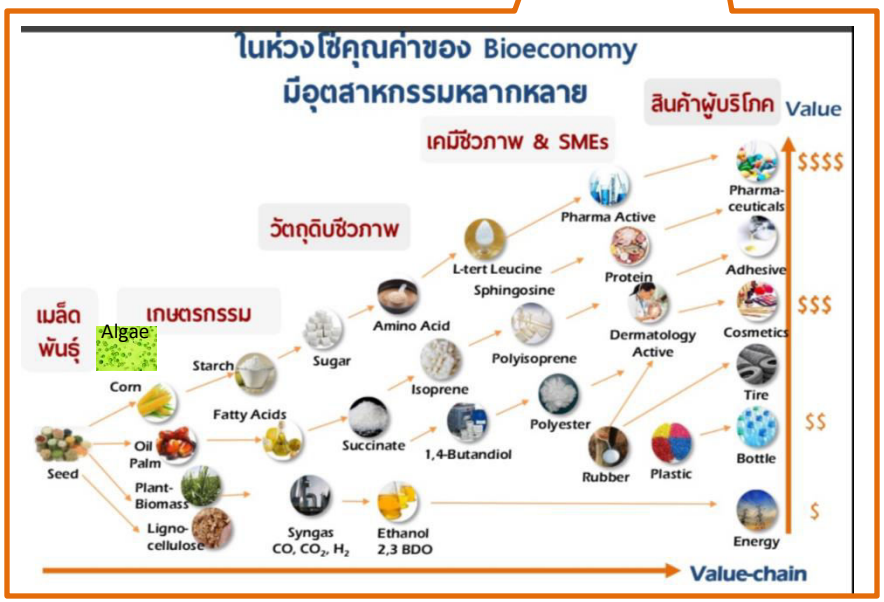
THINK GREEN



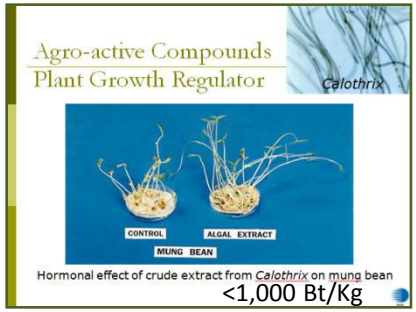
Policy (AEDP 2015-2036)

Algae Technology ,Thailand Super cluster and Bioeconomy

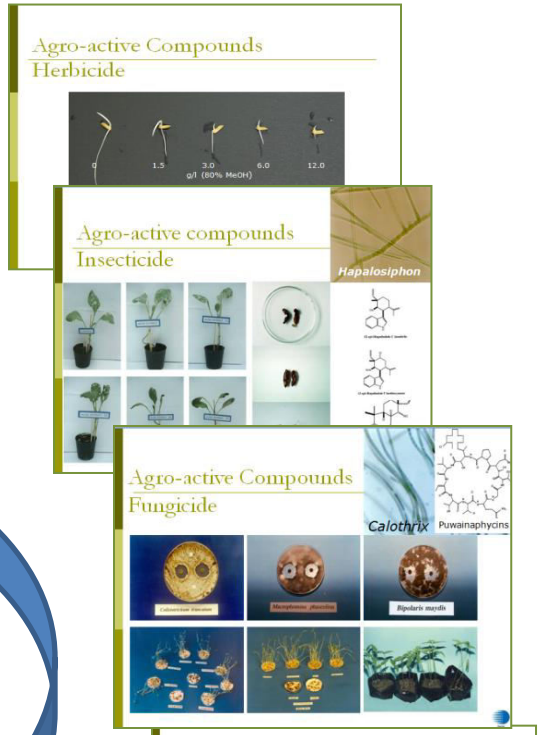
https://twitter.com/oie_news



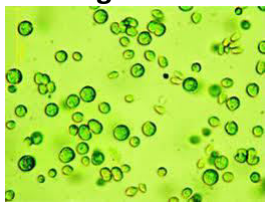
http://www.slideshare.net/htk999?utm_campaign=profiletracking&utm_medium=sssite&utm_source=ssslideview



<1,000 Bt/Kg



Algae RD&I



New market

Protein

30-40 Bt/kg (crude)/300-4,000 Bt/kg

Pigment

7,000-90,000 Bt/Kg

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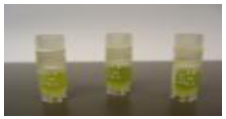
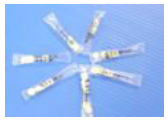
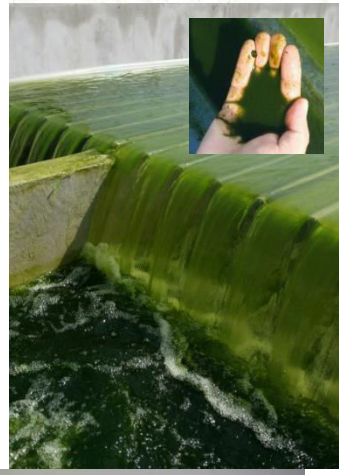
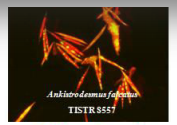
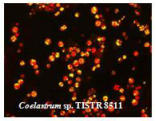


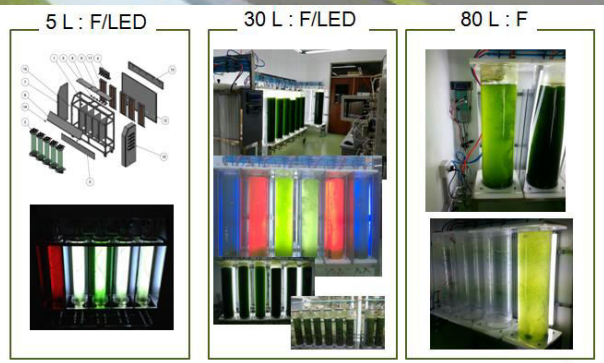


New research facilities



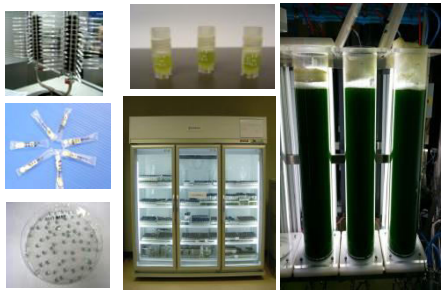






TISTR AEC

1995
Algae Culture collection and R&D



2004-2010
Technology Transfer & Service

Biofertilizer (N_2-fixing)

- Soil conditioner (polysaccharide-producing)

- Food (edible *Nostoc* ball)

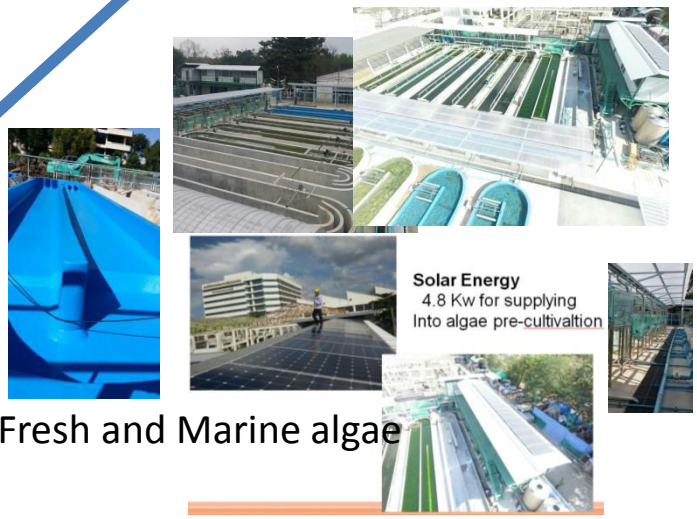
- Testing service

Thai Industrial Standard TIS 2321-2549
"Weather Resistant Emulsion Paints"

2011-2015
THINK ALGAE

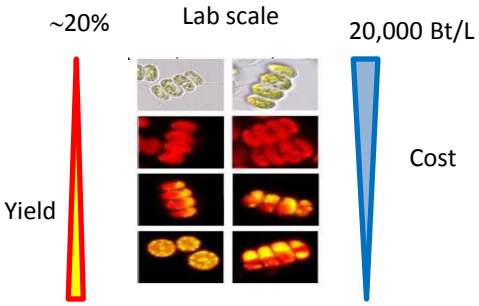
2012-2016
TISTR AEC

2015-2016
Fresh and Marine algae



Product/Process innovation

Result



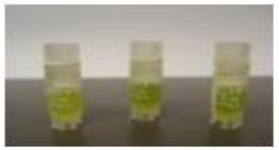
Oil production yield and cost

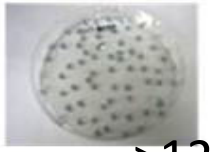
สถาบันวิจัยวิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย (วว.)
Thailand Institute of Scientific and Technological Research (TISTR)
กระทรวงวิทยาศาสตร์และเทคโนโลยี
วว./TISTR

Technology network and Innovation for 3rd Gen. Bio-fuel

Strategy

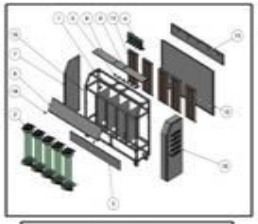
Algae resources

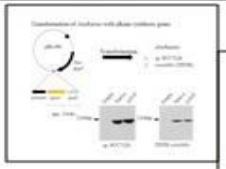


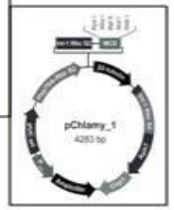


>1200 strains

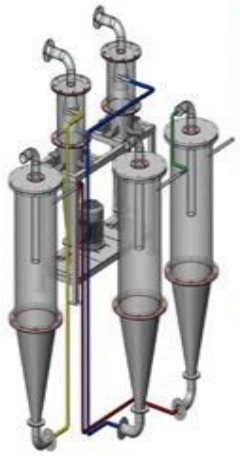
Biotechnology

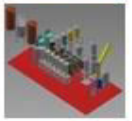


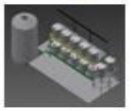




Engineering







Multidisciplinary Collaboration

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Thailand Collaborative Network on Microalgae Energy