PRESIDENT"S DELIVERY UNIT
FOR DEVELOPMENT MONITORING AND OVERSIGHT

INDONESIA NATIONAL COMMITTEE FOR
APPLIED SYSTEMS ANALYSIS

BECCS: INDONESIA MOVING FORWARD

University of Sao Paulo, 13th June 2013

INDONESIA AND BECCS

BECCS Workshop:
Options for Indonesia
Jakarta, 21-22 Sept 2012

BECCS
Expert Workshop
Laxenburg, 4 November 2011

BECCS Working Group
Establishment
March 2013

BECCS Workshop:
Options for Brazil
13-14 June 2013

The 2nd Workshop on
Bioenergy, CCS and BECCS

"Enhancing Carbon Emissions Reduction Through Bioenergy and Carbon Capture & Storage"

Jakarta, 24 Agustus 2013

Indonesia National Committee for Applied Systems Analysis

?

Pro growth, pro poor, pro jobs, pro environment …

7%+

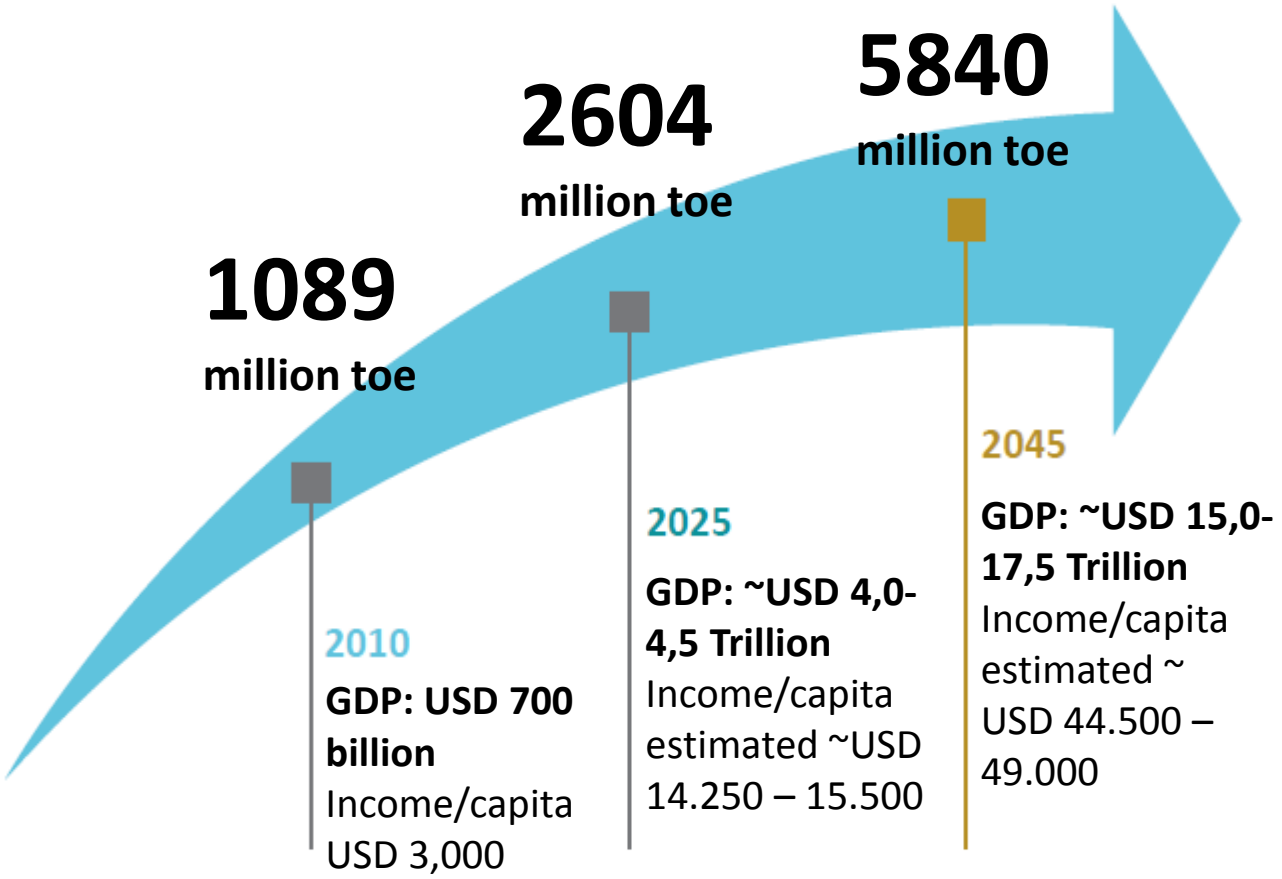
GROWTH

BALANCING

26-41%

EMISSION REDUCTION

COPING WITH DOUBLE CONSTRAINTS



7% +
GROWTH

BALANCING

26-41%
EMISSION REDUCTION

Source: National Energy Council & Economic Development Acceleration Master Plan (2011)

RESULT OF BECCS WORKSHOP: OPTIONS FOR INDONESIA

BECCS policy approaches for Indonesia

- Consider for BECCS inclusion into NAMAs Framework
- Moving beyond carbon – transforming co-benefits into main benefits
- Pursue international funding for a BECCS demo project in Indonesia
- Develop a BECCS sustainability guideline – How to do BECCS in Indonesia
- Research for integrated assessment – bringing existing resources together
- Develop an International BECCS governmental network initiated by Indonesia
- Getting bioenergy policy framework right for Indonesia

RESULT OF BECCS WORKSHOP: JOINT STUDY ON OPTIMAL SITING & SCALING OF BIOENERGY PLANTS

Bioenergy Plus Carbon Capture And Storage Options for Indonesia

Jakarta workshop: IIASA, IEA, the Republic of Indonesia's Ministry of Energy and Mineral Resources (MEMR) and President's Delivery Unit for Monitoring and Oversight (UKP4), the School of Business and Management at Bandung Institute of Technology (SBMITB).

Preliminary Results
– optimal siting and scaling of bioenergy plants

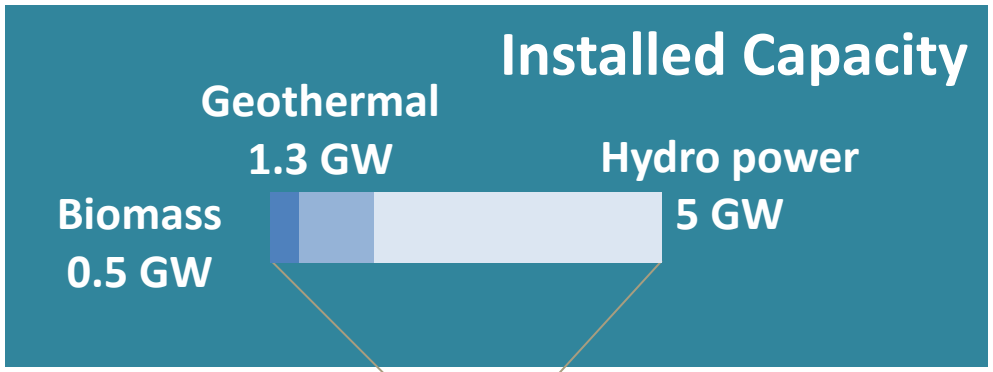
- Methanol production
  - Highest biofuel efficiency (55% energy content)
- Plant capacity: 650,000 t wood/year
- Total biofuel output: ~79,000 toe/year

Similar studies conducted in Europe, Japan, Republic of Korea, Russia

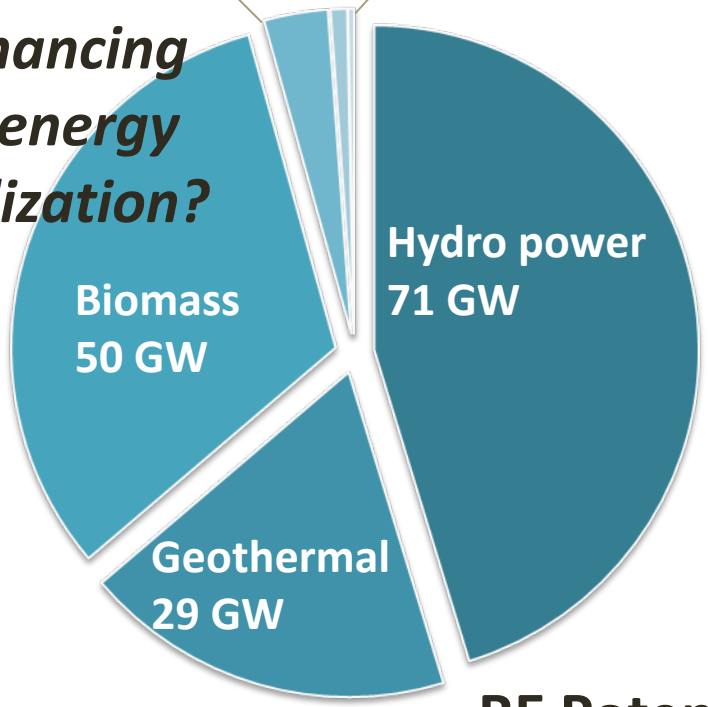
BECCS POLICY PRIORITY FOR INDONESIA

- **Indonesia Working Group - Getting bioenergy policy right for Indonesia – Building in a BECCS context**
  - Explore purpose of a pilot, coordination of ministry input, REDD, Timing and BECCS-ready and beyond, funds)
  - Optimal research priorities engaging local and social inputs, (i.e. poverty alleviation, scalable/sustainable feedstock, REDD)
  - Consults with private sector in order to understand what is needed to shift
  - Modelling exercise on BECCS-related topics
- **Leverage international/national expertise from CCS and existing platforms to build new network for BECCS**
  - Open an enriched perspective on BECCS when engaging on international framework design
  - Inclusion of BECCS into NAMAS –after thorough understanding

BECCS APPLICATION FOR INDONESIA: TWOFOLD CHALLENGES

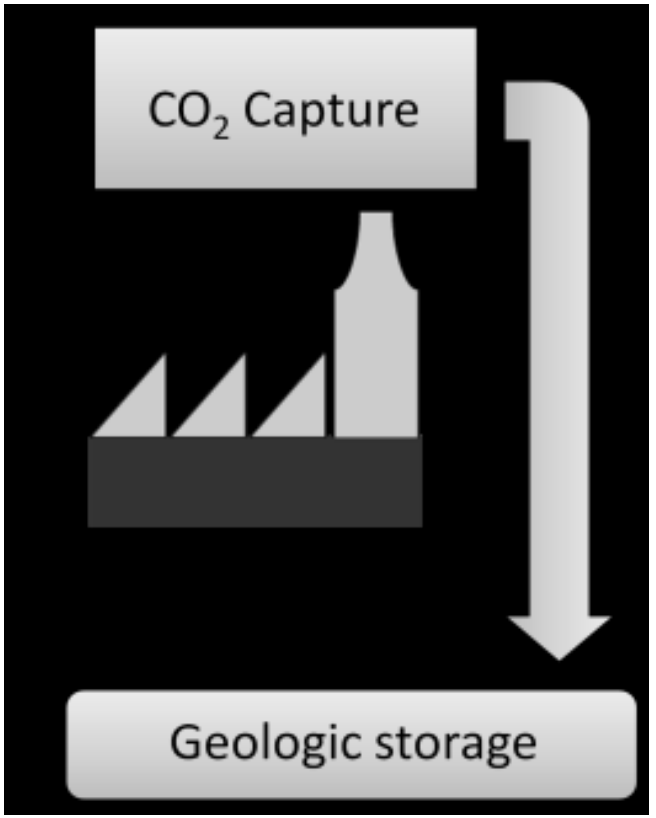


1 ***Enhancing bioenergy utilization?***



RE Potential

2 ***CCS***



GETTING BIOENERGY POLICY RIGHT FOR INDONESIA

Feedstock

- Energy Crops
- Agriculture crops residue

Utilization

- Biofuel
- Gasification
- Biomass thermal power plant

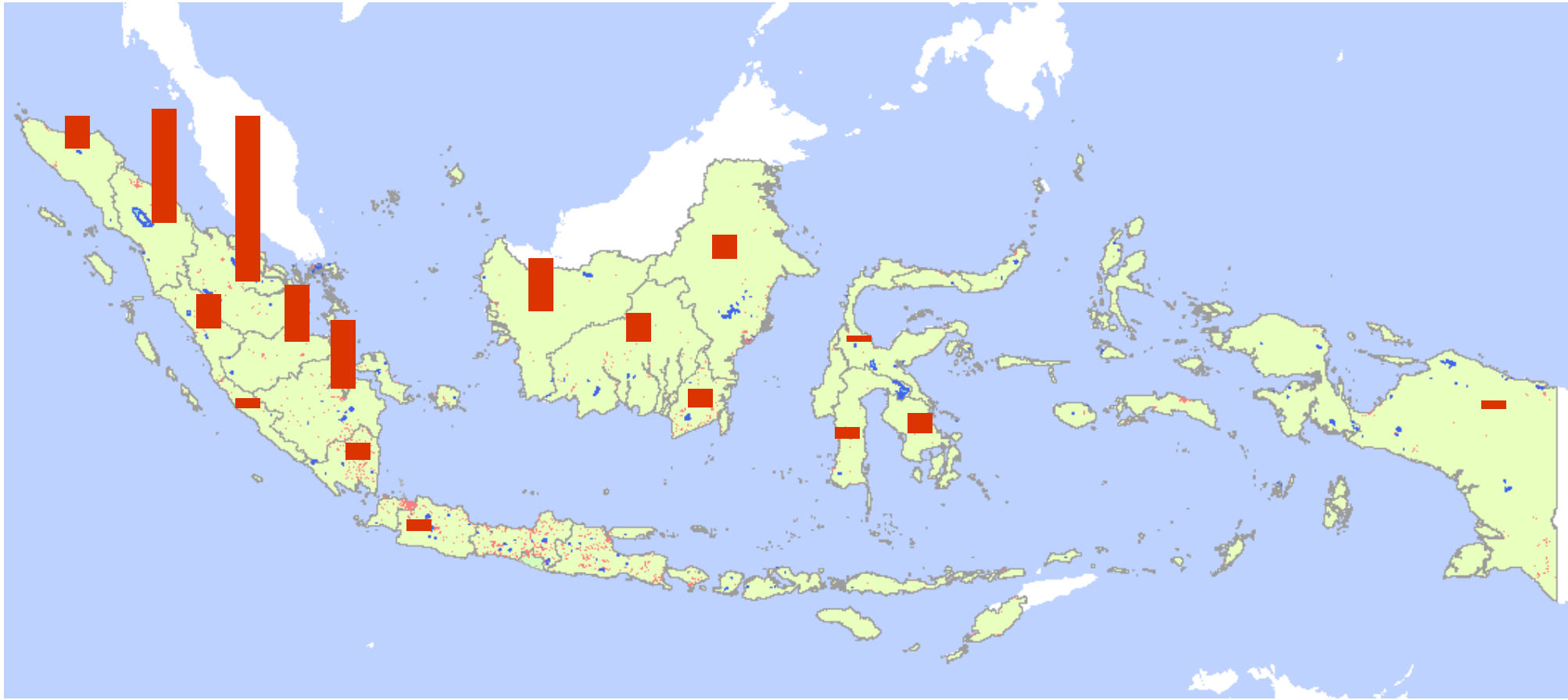
Consideration

- Energy VS Food
- Deforestation
- Land use/land use change
- Biodiversity
- Life cycle carbon footprint
- Availability
- Logistics
- Cost
- Energy and cost efficient large scale VS “Energy for all” small scale

Constraints

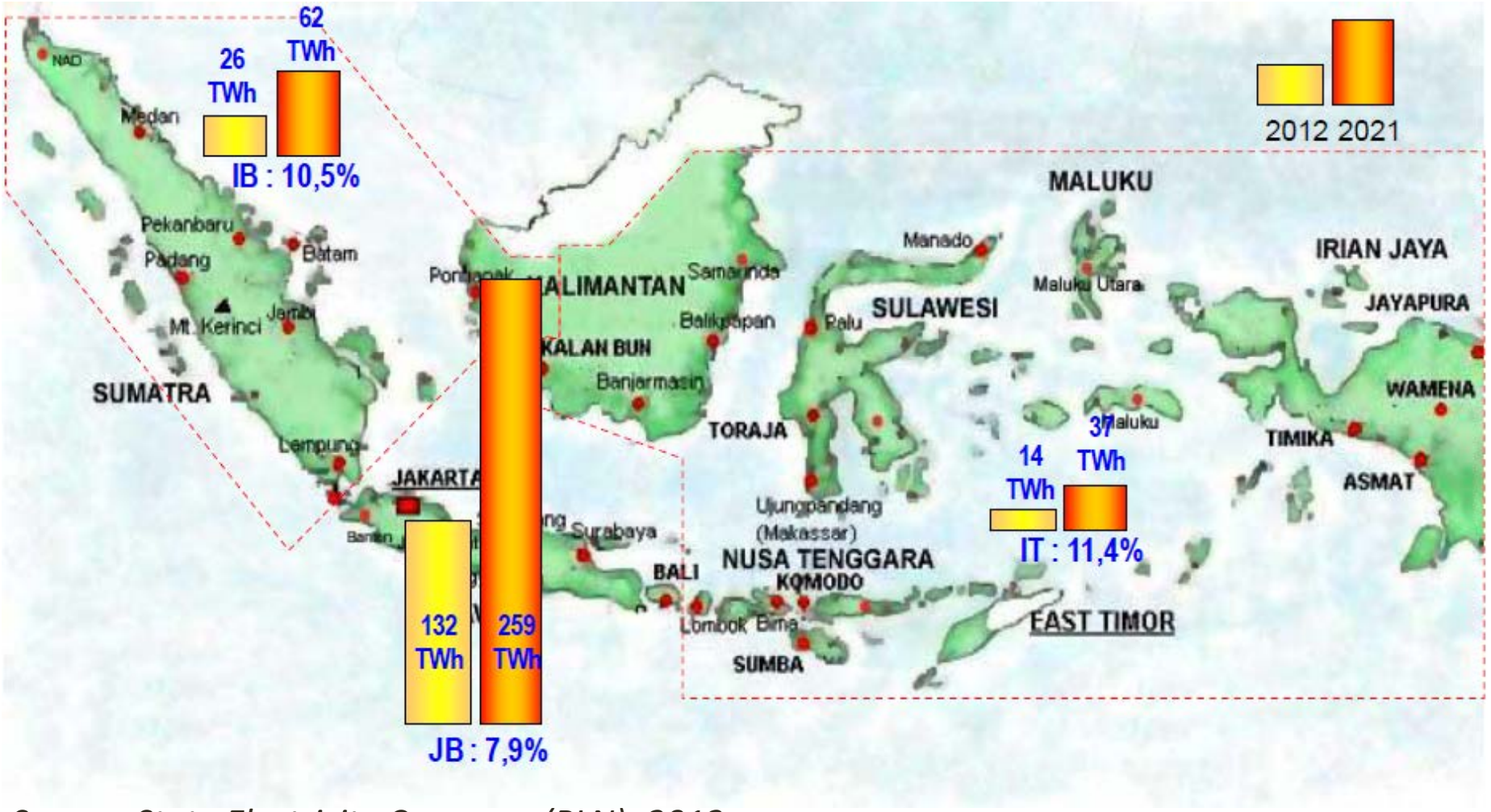
- Grid Infrastructure
- Energy demand
- Geographic challenges
- Technology

CONSTRAINTS OF BIOENERGY DEVELOPMENT (1/2): PALM PLANTATION SPREAD



Source: Ministry of Industry, 2011

CONSTRAINTS OF BIOENERGY DEVELOPMENT (2/2): ELECTRICITY DEMAND SPREAD



Source: State Electricity Company (PLN), 2012

SITE VISIT TO BIOMASS POWER PLANT 2 X 15 MW (23 SEPTEMBER 2012)

Lessons learned:

- Potential for complete cycle negative emission application (biofuel from palm oil, palm waste-fired thermal power plant with CCS application)
- CPO are exported without domestic bioenergy application
- Limited feedstock availability due to logistics, seasonality, biomass import demand, etc





FIRST STEP ON ROADMAPPING BIOENERGY DEVELOPMENT (INTEGRATING BECCS)

Focus area

- Policies and Regulation around bioenergy, CCS and BECCS
- Sustainability indicators for bioenergy
- Options, storage capacity, technology and application of CCS (including capture, transport, storage and utilization)
- BECCS projection scenarios, technology and application
- Bioenergy resource availability (such as biomass, city waste, biofuel crops, agricultural waste)
- Bioenergy emission and carbon stock (including LCA and MRV)
- Land use issues in Bioenergy and CCS context

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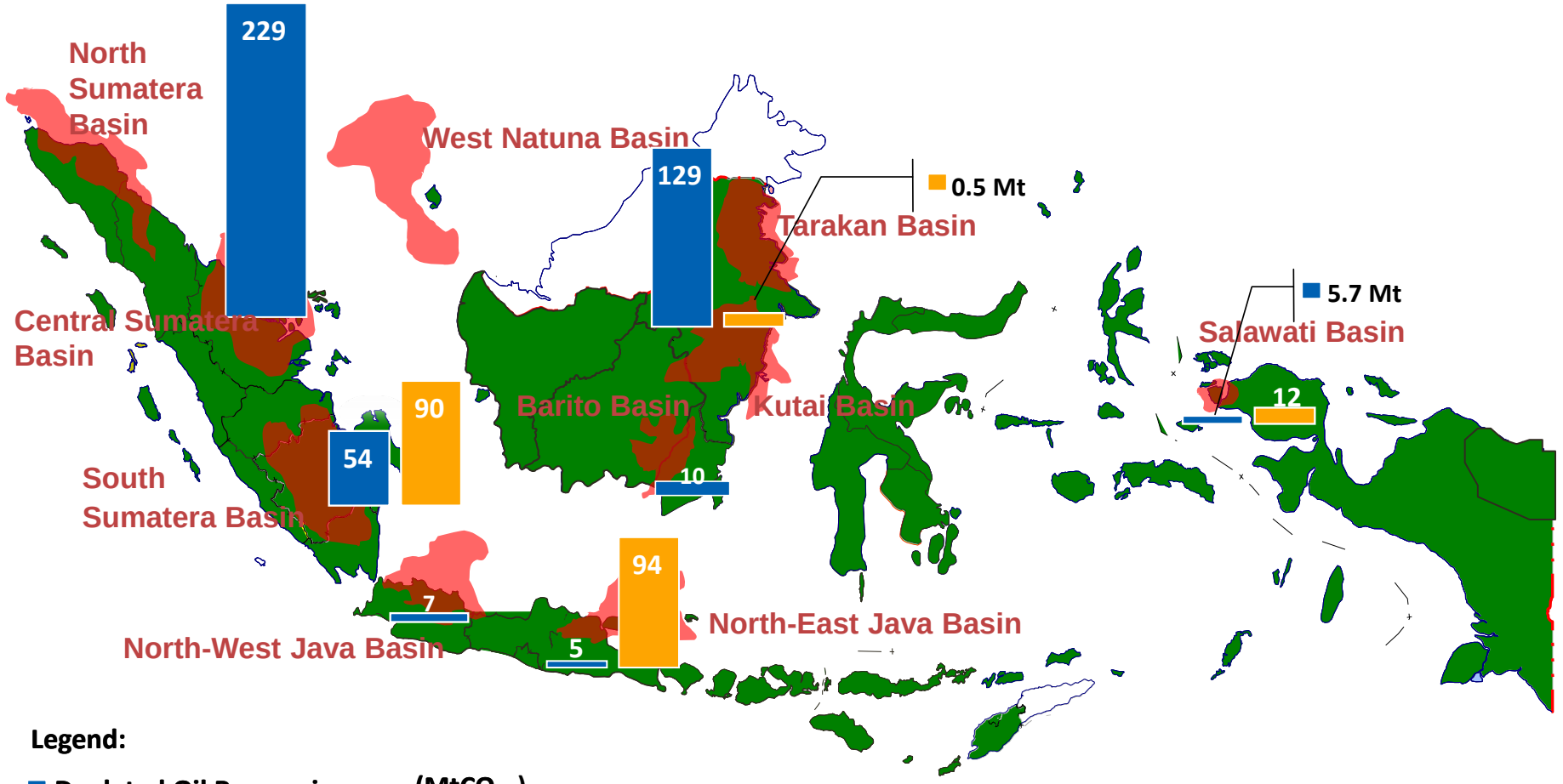
CO2 STORAGE CAPACITY ESTIMATES IN DEPLETED OIL AND GAS FIELD



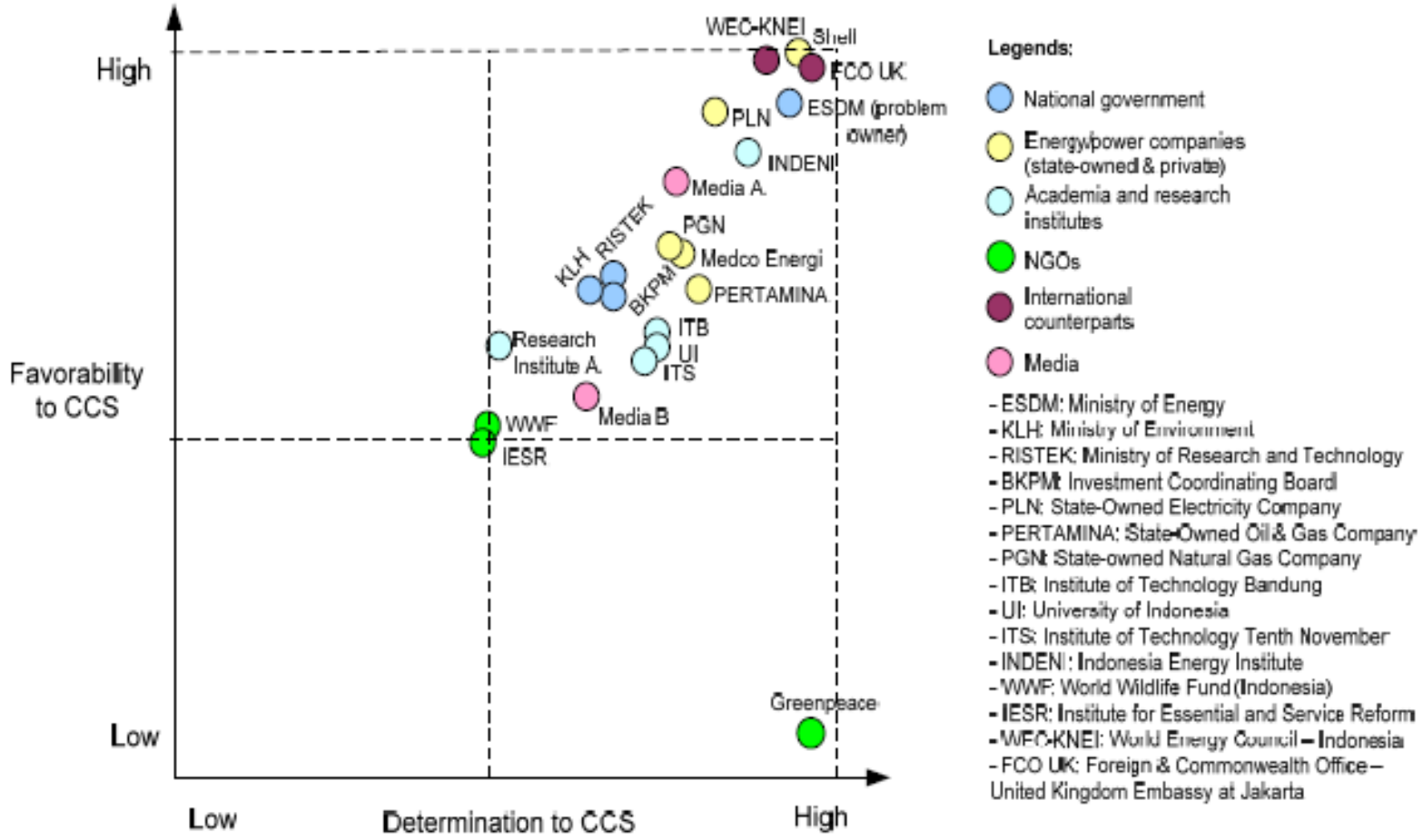
Source: LEMIGAS, Ministry of Energy and Mineral Resources, 2012

10 MOST SUITABLE SEDIMENTARY BASINS FOR CO2 STORAGE

No.	Basin Name	Region	Suitability Score
1	Kutai	East Kalimantan	0.913
2	Tarakan	East Kalimantan	0.777
3	South Sumatera	South Sumatera	0.756
4	Seram	Maluku	0.735
5	North West Java	West Java	0.723
6	Barito	Central-South Kalimantan	0.722
7	Central Sumatera	Riau	0.715
8	North Sumatera	North Sumatera	0.702
9	Salawati	Papua	0.690
10	North East Java	East Java	0.683

Main Factor
▪ Well characterized reservoirs
▪ Favorable and well-known geological structure
▪ There is potential to reuse existing infrastructure

SOCIO-ECONOMIC (AND POLITICAL?) ASPECTS OF CCS NEED TO BE CONSIDERED TOO



Source: Setiawan, A.D. (2010), Stakeholders Perspectives on Carbon Capture and Storage in Indonesia, Master's Thesis, TU Delft

- Position of NGOs (WWF, Greenpeace, and local-based IESR) being least favorable toward CCS
- A more thorough understanding and accurate mapping of the perceived acceptance is required

THANK YOU AND WELCOME YOU TO.....

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