KEMENTERIAN ENERGI
& SUMBER DAYA MINERAL

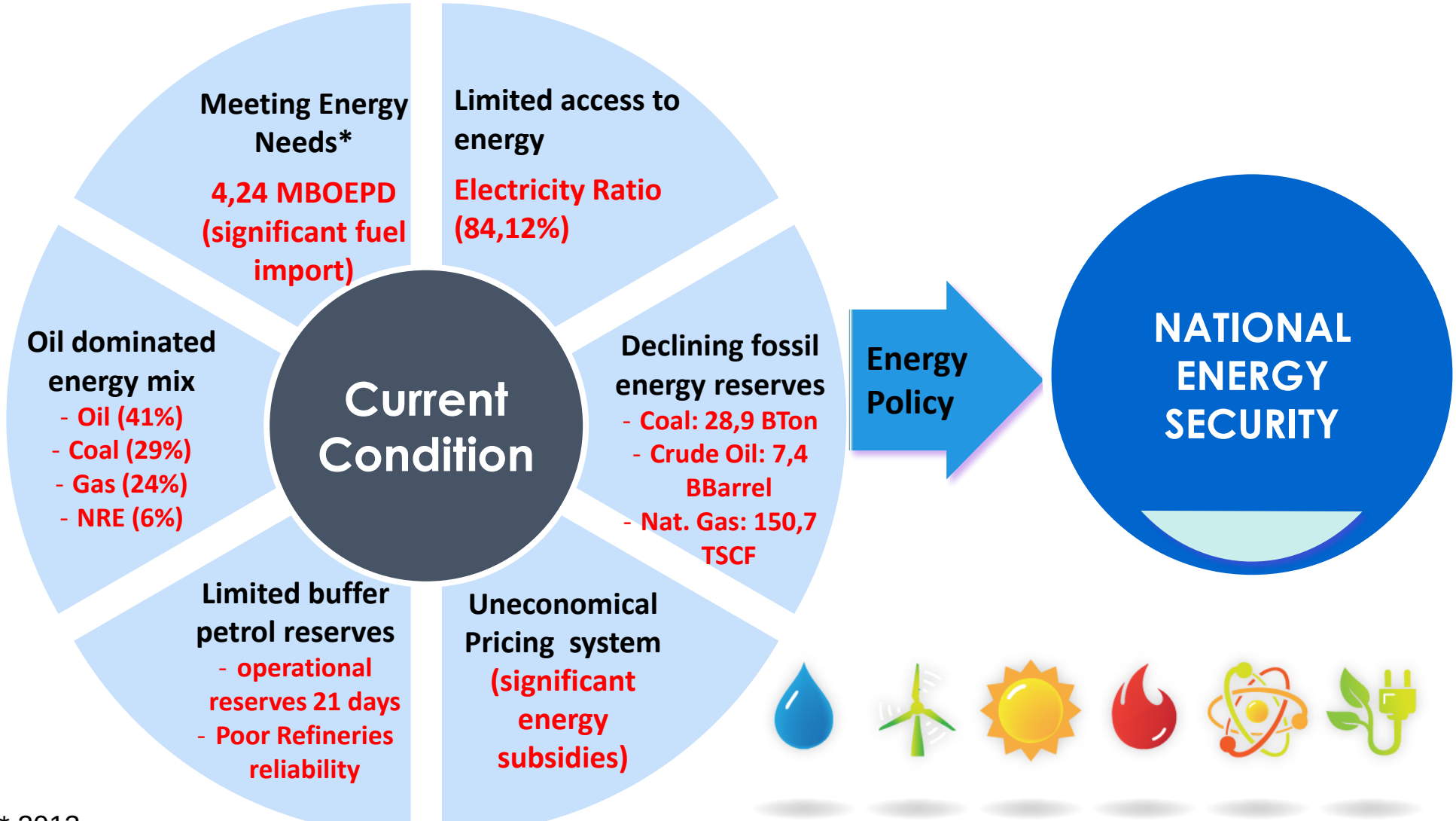
CENTER OF EXCELLENCE (COE) FOR CLEAN ENERGY IN INDONESIA

OCTOBER 2015

2 INTRODUCTION

- Increasing pressure on the supply and access of energy to accommodate its economic and social development of Indonesia
- National necessity for utilization of the country's vast available renewable-energy sources
- Establishment of a separate Directorate General for Renewable Energy and Energy Conservation under the MEMR in 2010 as part of institutional development to support the acceleration of NRE contribution on energy sector
- The Ministry of Energy and Mineral Resource (MEMR) will establish a Centre of Excellence (COE) to support the national clean-energy programme
- COE will be established to bring together national and international expertise and public-and private-entities to assist in the transfer and deployment of technologies through innovative financing and business models

GREAT CHALLENGES IN MANAGING NATIONAL ENERGY

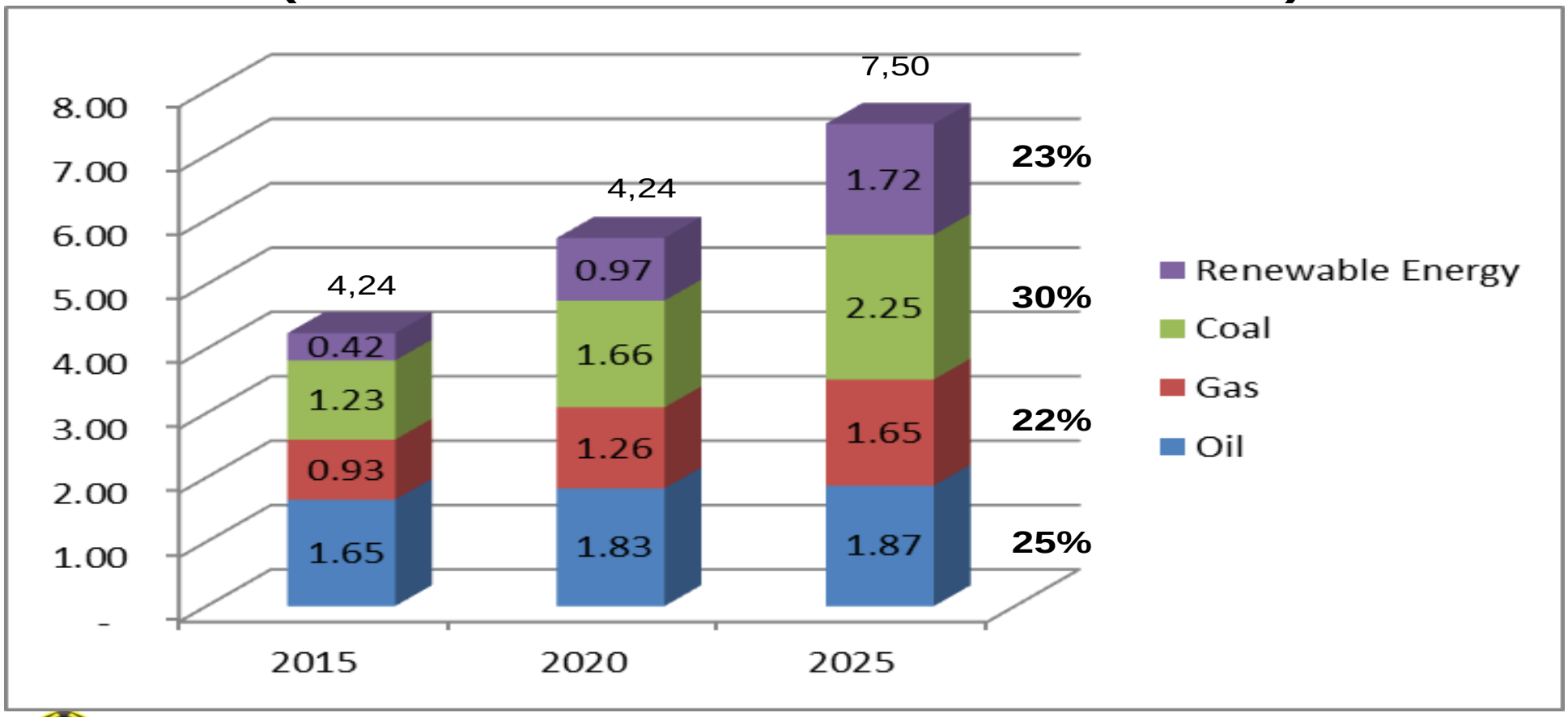


* 2013

ENERGY SECURITY CHALLENGES IN INDONESIA

PROJECTION OF ENERGY DEMAND (NATIONAL ENERGY POLICY TARGET)

Million BOEPD



5 The Potential Of Nre Resources And Ec Implementation

POTENTIAL OF NRE RESOURCES

NO	NEW RENEWABLE ENERGY	RESOURCES	INSTALLED CAPACITY (IC)	RATIO OF IC/RESOURCES (%)
1	2	3	4	5 = 4/3
1	Hydro	75,000 MW	7,572 MW	10.1 %
2	Geothermal	28,910 MW	1,403.5 MW	4.9 %
3	Biomass	32,654 MW	1,717.9 MW	5.4 %
4	Solar	112.000 GW(4.80 kWh/m^2/day)*****	48.05 MW	-
5	Wind	3 – 6 m/s	1.87 MW	-
6	Ocean	61 GW ***)	0.01 MW ****)	-
7	Uranium	3,000 MW *)	30 MW **)	-

*) Only in Kalan – West Borneo

**) As a center of research, non-energy

***) Source: R&D Agency of EMR

****) BPPT's Prototype *****) Source R&D A of EMR

POTENTIAL OF ENERGY CONSERVATION

NO	SECTOR	ENERGY CONSUMPTION PER SECTOR 2012 (MBOE) *)	POTENTIAL OF ENERGY CONSERVATION	TARGET OF SECTORAL ENERGY CONSERVATION (2025)
1	Industry	305 (39,7%)	10 – 30%	17%
2	Transportation	311 (40,4%)	15 – 35%	20%
3	Household	92 (12%)	15 – 30%	15%
4	Commercial	34 (4,4%)	10 – 30%	15%
5	Others (Agriculture, Construction, and Mining)	26 (3,4%)	25%	-

*) Preliminary figures up to December 2013 excluding biomass and the use of non-energy

Source: Draft on National Energy Conservation Master Plan 2011

CHALLENGES OF NRE DEVELOPMENT AND THE ROLE OF COE

NO	KEY ISSUES	CHALLENGES	PROPOSED SOLUTIONS
1.	Technology	• Relatively immature technology and high costs • Value chain has not been established • Limited expertise	• Capacity building for local human resources • Fiscal and tax incentives for NRE technology • Significant improvement on budget allocation for NRE R&D
2.	Economic of feedstock	• Frequently higher of biofuel feedstock prices than petroleum ones • Limited allocation land for bioenergy feedstock	• Implementation of energy forest and plantations • Mandatory use of NRE policy
3.	Funding	• NRE investment is not attractive • Requirement of significant amount of working capitals	• Special fund from national financial institution for supporting NRE projects • Special state budget allocation for initial project development on NRE
4.	Regulation	• Various regulation related constraints • Lack of law enforcement • Legal uncertainty on the implementation of regulation for feed in tariff	• Implementation of cost related pricing policy • Harmonization of various NRE related regulations • Legal certainty • Simplifying license procedure for land acquisition

GENERAL STRATEGY TO INCREASE NRE UTILIZATION

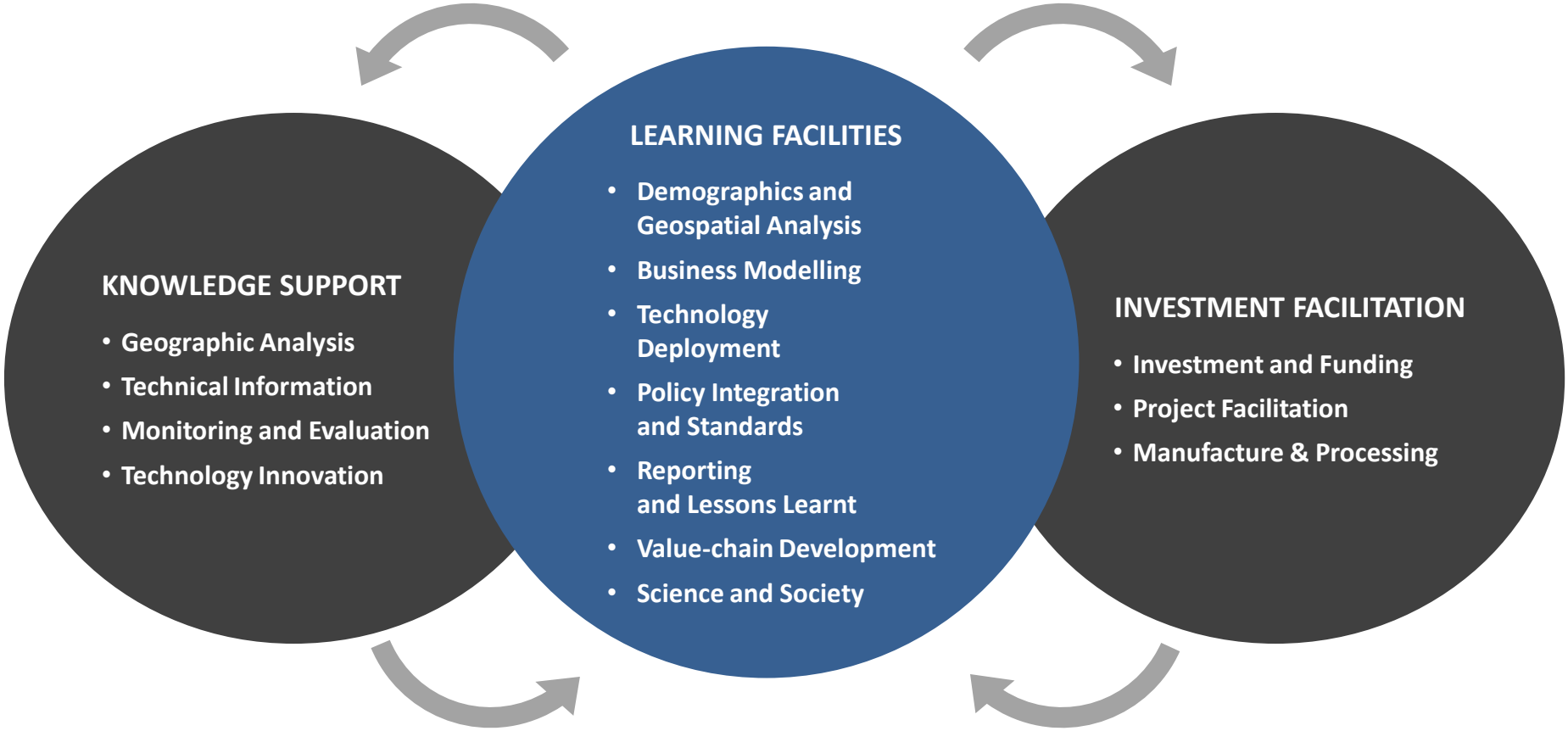
1. **CREATING MARKET**
   - Through the activities of privisioning (supplying) and utilization of bio-fuel, obligating National Electric Company (PT PLN) to buy electricity, the application of Indonesian National Standard (SNI), biofuel mandatory;
   - Intensive large scale NRE development: bioenergy forest and platations
   - Development of cluster economy based on NRE utilization
   - Integrated NRE and rural regional development
2. **SUBSIDY**
   - The subsidy program for bio-fuel has been running since 2009. Subsidies are provided on the difference between fuel prices and bio-fuel prices, distributed through Pertamina;
   - Subsidy is also provided for plantation
3. **FEED-IN TARIFF**
   - Declared through the Minister of Energy and Mineral Resources Regulation, regulates the selling price of electricity from renewable energy purchased by National Electric Company. There should be no negotiations;
4. **PROVIDING INCENTIVES AND FACILITIES**
   - Reduction of taxes and customs duties, licensing procedures to be simplified;
   - Electricity produced by power plants up-to 10 MW will be sold to PLN; no signing of Power Purchase Agreement is needed.

COE's ROLE: BUSINESS INCUBATOR FOR NRE DEVELOPMENT

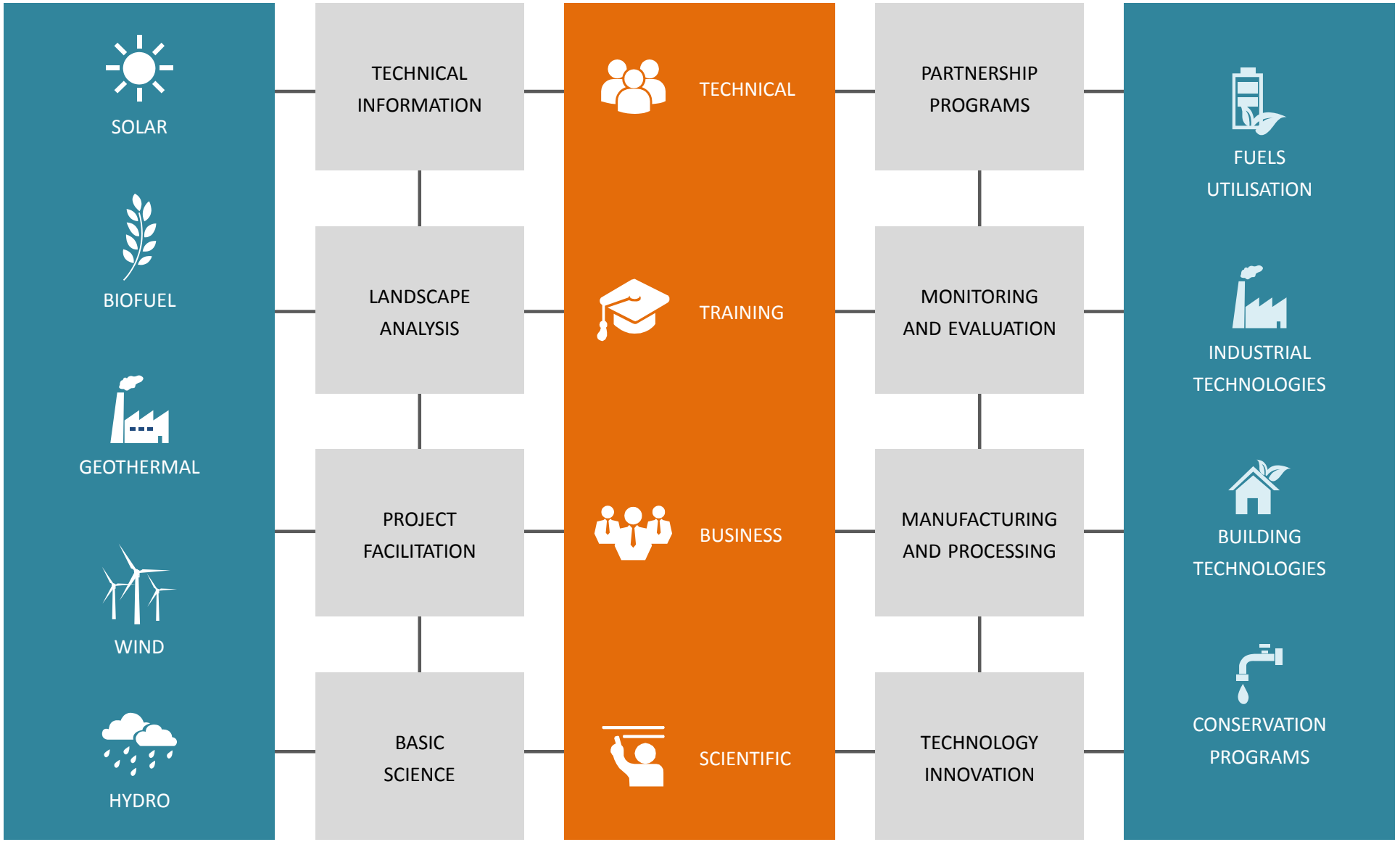
OBJECTIVES OF COE

1. NRE technology integration and knowledge development at micro through to medium enterprise and industry levels;
2. Research, development and demonstration activities in controlled environments and as pilot projects;
3. Project development and implementation support in cooperation with MEMR, related sector ministries and provincial governments;
4. Optimising policy and regulatory frameworks to enhance private-sector investment and participation; and
5. Innovative solutions to mitigate costs and risks for the public- and private-sector in the deployment of NRE.

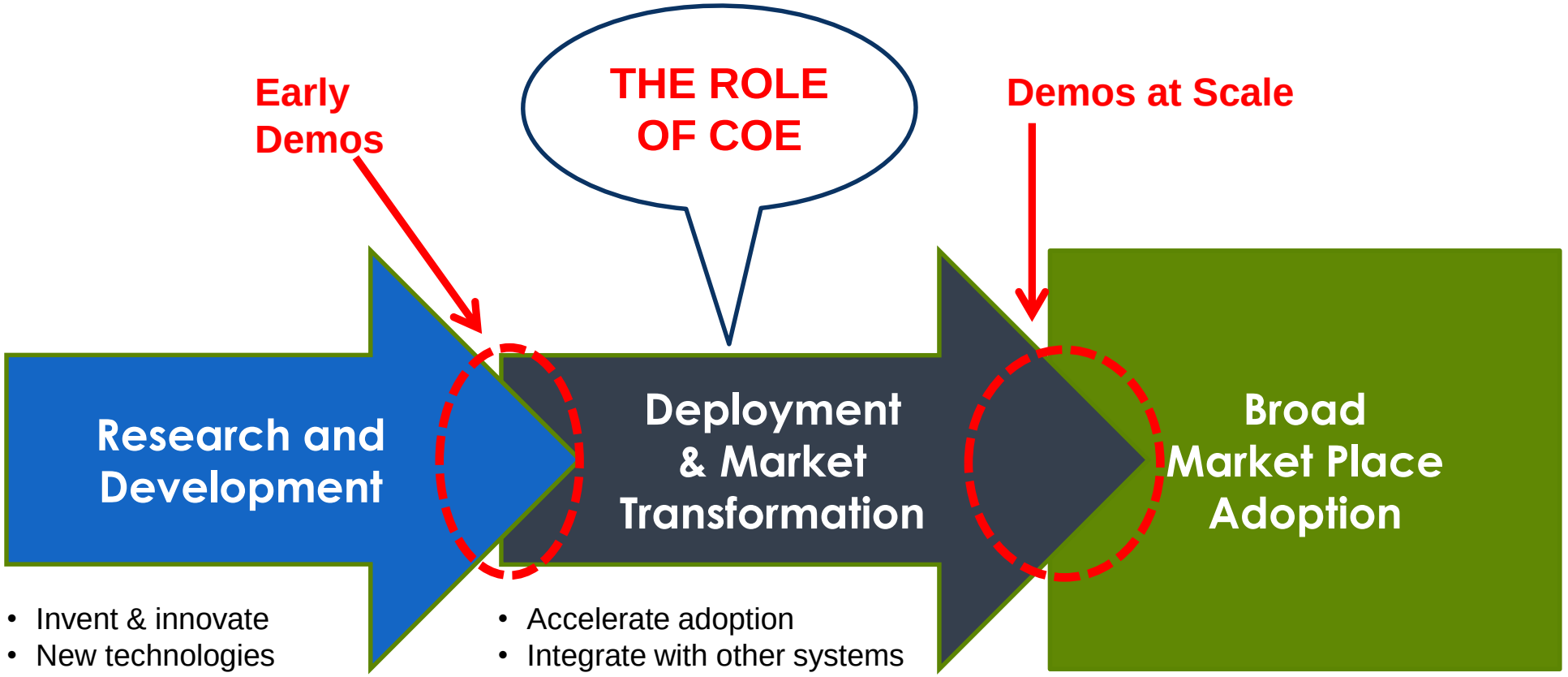
COE'S SCOPE OF WORK



ACTIVITIES OF COE



THE ROLE OF R&D AND COE ON THE TRANSITION FROM RESEARCH TO MARKET ADOPTION



- Invent & innovate
- New technologies
- New products
- Create options for society
- Improve performance
- Improve reliability
- Reduce technology risks
- Test new advances

- Accelerate adoption
- Integrate with other systems
- Take technologies from demo to replicable adoption
- Validate performance and reliability
- Partner with stakeholders
- Overcome barriers to use
- Reduce investment risks
- Develop and implement codes & standards

- Accessible to consumers
- Easy to use & maintain
- Reliable
- Affordable and secure
- Attractive investment option
- Demand from marketplace
- Diverse supply options
- Creation of jobs

COE FIELD STATIONS

The development of the COE will require partnering with, or establishing, field stations that will function as support centres for ground truthing, project implementation support and monitoring and evaluation. These stations, the location of which are to be determined and demand driven, will provide an interface with local governments and communities and report on potential or emerging bottlenecks which can be relayed to the appropriate authorities through mechanisms to be established by the Centre.

13 COE PROGRAM : THREE TIER

TIER

2015-2016

Cakrawala 1:
0 s/d 18 month

a. Reuse *waste heat becomes cooling system* of Pesanggaran Diesel Power Plant
b. *Smart system in* Universitas Udayana
c. Building Pilot Project Marine Current Turbin in Toyopakeh Strait
d. Revitalization Windmill Turbin in Nusa Penida and Solar Power Plant in Bangli
e. Waste to energy plant in TPA Suwung

2016-2017

Cakrawala 2:
12 s/d 36 month

- Fuel conversion from coal to gas for Pasangaran, Gilimanuk, Pemaron power plant
- Building Gas Power Plant in Jembrana
- Building geothermal instalation power plant in Bedugul

2017-2018

Cakrawala 3:
36 months

- Building *renewable field stations* monitoring centre in Indonesia.
- Encourage applied research for clean energy , especially marine -based such as currents , algae , OTEC , and other clean energy

Time

Enabling Conditions:

- Data and Information management.
- Goverment regulation : incentive, gas supply , Public Private Partnership Regulation, financial regulation, etc.
- Local regulation, Bali city planning (RTRW), infrastructure planning, and permission (LULUCF).
- Socialitation and local campaign.

POTENTIAL COOPERATION WITH STAKEHOLDERS

Cooperation on Human Resources Development

- Capacity building on policy, planing and technical issues
- Exchange of experiences and sucess stories
- Conducting joint seminar, conference and exhibition
- Graduate and post graduate studies on NRE

Cooperation on tecnological development and deployment

- Research and development of NRE
- Research and development of second generation of biofuel with focusing on macro algae and cellulosic based bioethanol
- Development and deployment of technologies on hybrid energy system
- R&D on smart system and other NRE

Cooperation on Business Development

- Model project for nre
- Feasibility study on nre projects for investment
- Investment on nre based project, such as bioenergy, MSW, waste of agroindustry, biomass, biogas, wind energy, ocean energy, solar, and other NRE
- Utilization of NRE
- Trading

AREAS FOR FURTHER ELABORATION BY KNEB TEAM :

1. Function, tasks and organization structure of COE
2. Program and activities of COE in the short, medium and long terms, especially quick wins of COE
3. Office of COE: building and facilities
4. Maximize the benefit of cooperation with various parties: Prospectus financial institutions among others Asian Development Bank (ADB), Korea Trade Investment Promotion Agency (KOTRA), US Agency for International Develpment (USAID), Australian Indonesian Cooperation (AIC); and internationally reputable R&D institutions such as NREL
5. How does the KNEB Team develop roadmap based on the above items?

COE START UP ACTIVITIES

The COE will begin immediately to assist national programmes as a “virtual” Centre. This involvement will support the Centres development.

- PETDES, Program Energi Terbarukan Desa, designed to increase the national electrification ratio to 100% by providing renewable off-grid systems
- Raising Bioenergy Crops on degraded land, programs have already started in Central Kalaimantan
- KNEB-BALI
- Field stations, partnering with, or establishing, tol function as support centres for ground truthing, project implementation support and monitoring and evaluation.
- Seven economic clusters

KEMENTERIAN ENERGI
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THANK YOU

http://www.litbang.esdm.go.id
http:// www.lemigas.esdm.go.id
http:// www.p3tkebt.esdm.go.id
http:// www.tekmira.esdm.go.id
http:// www.mgi.esdm.go.id

TIMELINE

No	Kegiatan	Juli				Agustus				Sept				Oktober				November				Desember				Januari			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sayembara Konsep Desain Center of Excellence 2015																													
1	Persiapan koordinasi (teknis dan budget)	1																											
2	Pendekatan pemangku kepentingan	2																											
3	MoU Bali						3																						
4	Peluncuran kompetisi dan konferensi pers								4																				
5	Pendaftaran dan penyerahan desain								5																				
6	Penutupan pendaftaran													6															
7	Penjurian													7															
8	Pengumuman pemenang & Konferensi Pers																8												
Pengembangan Center of Excellence 2015 - 2016																													
9	Pembuatan FS							9																					
10	Peletakan batu pertama																									10			
11	Mulai pembangunan	** Setelah proses DED selesai – mulai 2016																											

PROPOSED OBJECTIVE OF COOPERATION BETWEEN BLB AND NREL

- establishment and operationalization of an Indonesian Centre of Excellence designed to support the acceleration of BLB's renewable energy program;
- development of the Centre's portfolio of research, development, demonstration and deployment programs;
- joint energy-analysis projects focusing on the sustainability of renewable-energy technologies with respect to Indonesia's climate and environment, including land, water and air;
- technology partnerships to facilitate an exchange of knowledge and the development and deployment of renewable technologies within Indonesia and for the broader global context, and
- establishment of education and workforce development programs

PROPOSED OUTCOME OF THE COOPERATION BETWEEN BLB AND NREL

- Indonesia's Centre of Excellence enables rapid deployment of renewable energy nation-wide and, through continued cooperation with NREL, contributes to the global shift towards clean energy;

- Scientific advancements in renewable energy for mainly tropical climates and environments continue to provide improved sustainable solutions for national and international clean-energy programs; and

- Established avenues for sharing and exchanging knowledge of, and technologies for, renewable energy that strengthens regional energy security and mitigates climate change.