



Economic Research Center
Indonesian Institute of Sciences (LIPI)

Community and engagement:

Renewable Energy in Rural Communities

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Abu Dhabi, 7 – 9 October 2013


Workshop on Social Acceptance of Renewable Energy

International Renewable Energy Agency (IRENA)

Establishment of LIPI

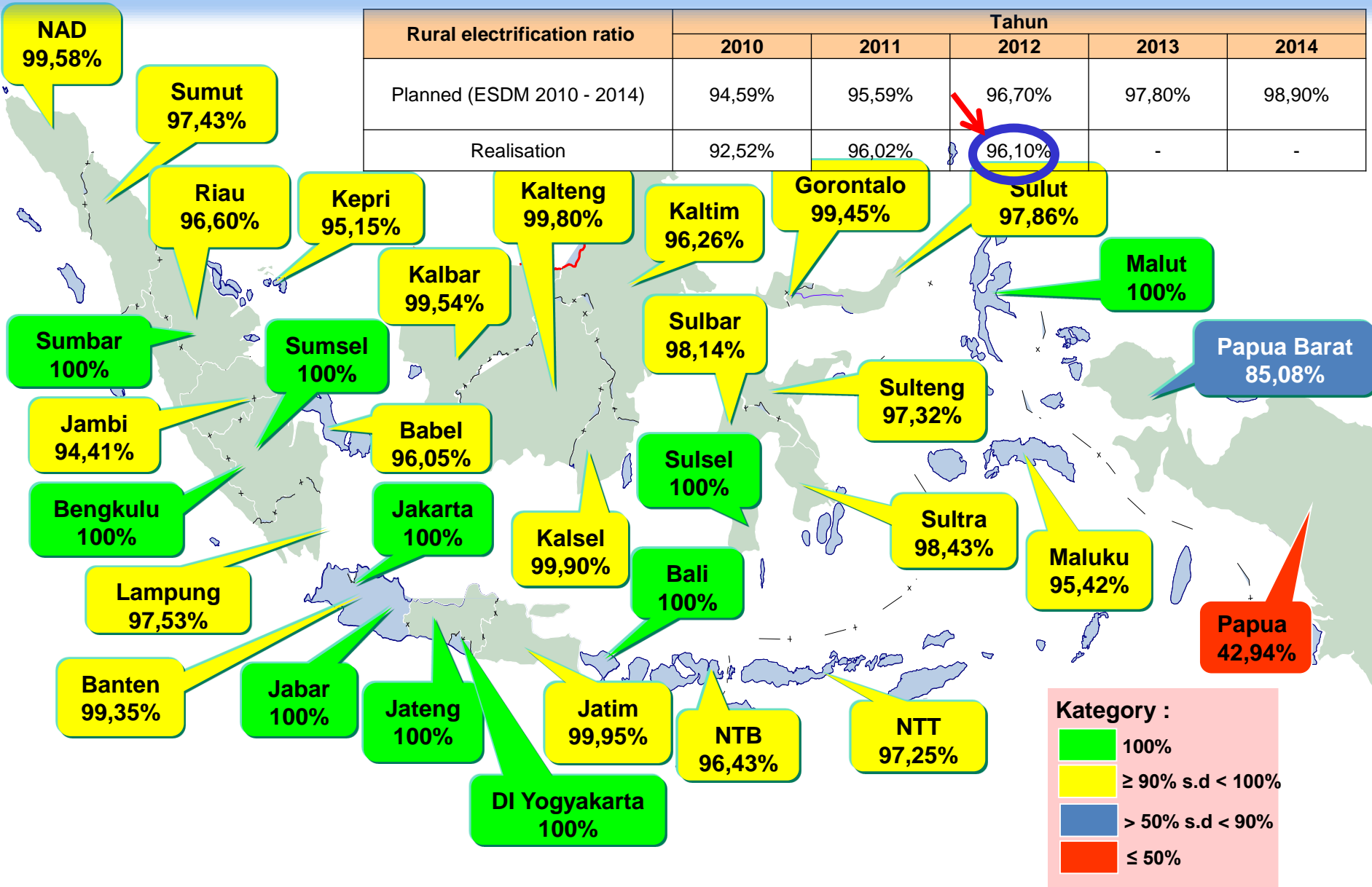
- LIPI was formed by *Keputusan Presiden No 128 Tahun 1967* (23 August 1967) – 46 Years
- *Keputusan Presiden No 103 Tahun 2001 Lembaga Pemerintah Non Departemen / LPND* (Non Ministerial government institutes). There are 25 organizations of LPND and LIPI is one of them
- LPND is under authority of President and they are directly responsible to the President, **but** (IBN)
- LIPI is under coordinated the State Ministry of Research and Technology

Organization of LIPI

- Chairman
- Vice chairman
- Principal secretary
- 1. Deputy for earth sciences
- 2. Deputy for life sciences
- 3. Deputy for engineering sciences
- 4. Deputy for social and humanity sciences
 - 1. Research center for society and culture
 - 2. **ECONOMIC RESEARCH CENTER (ERC)** 
 - 3. Research center for population
 - 4. Research center for politics
 - 5. Research center for regional resources
- 5. Deputy for scientific services

RURAL ELECTRIFICATION RATIO 2012

Rural electrification ratio	Tahun				
	2010	2011	2012	2013	2014
Planned (ESDM 2010 - 2014)	94,59%	95,59%	96,70%	97,80%	98,90%
Realisation	92,52%	96,02%	96,10%	-	-

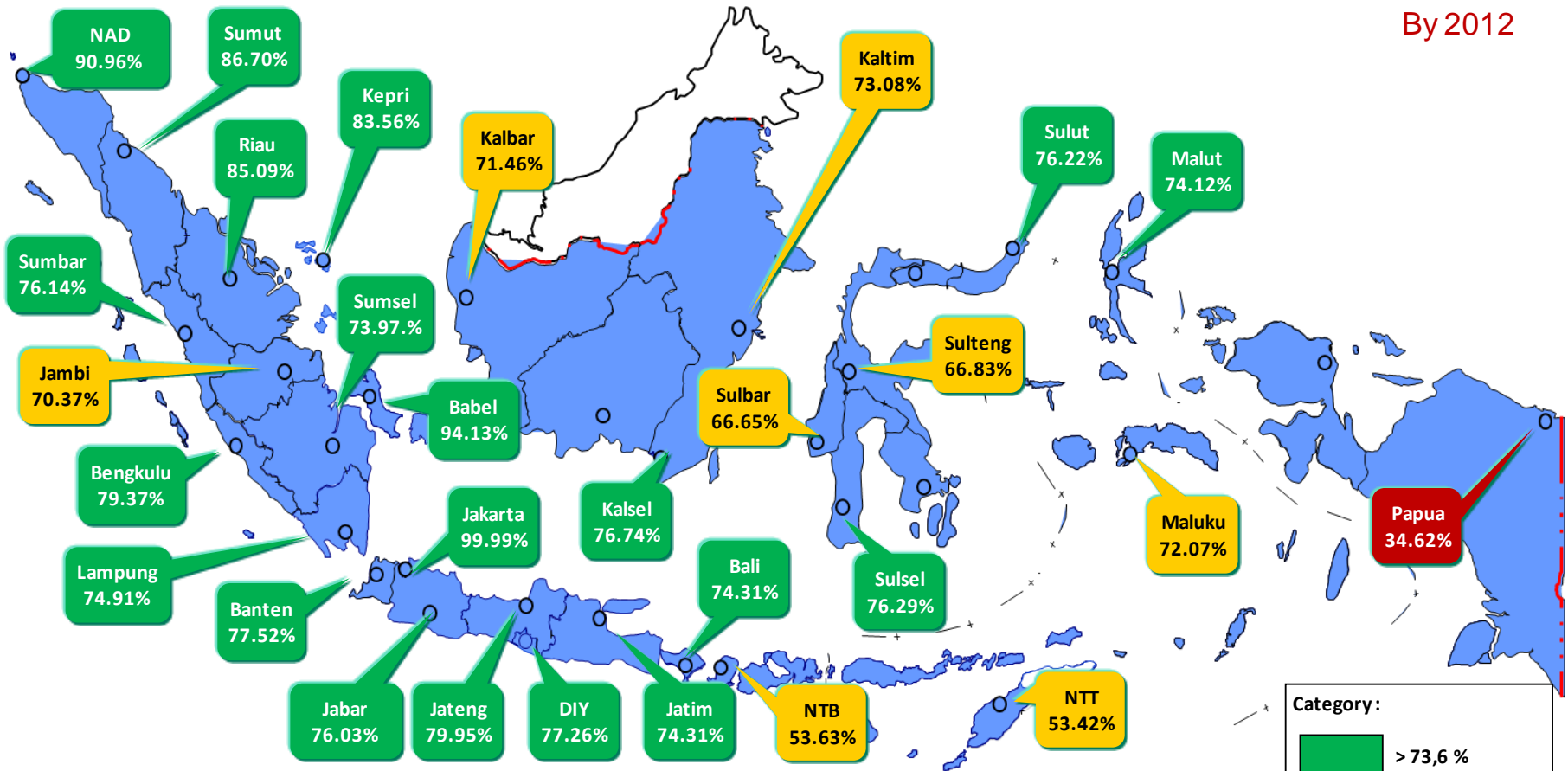


Kategori :

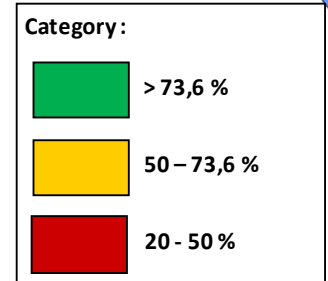
- 100%
- ≥ 90% s.d < 100%
- > 50% s.d < 90%
- ≤ 50%

ELECTRIFICATIO RATIO

By 2012



	REALISATION (%)						PLAN (%)	
	2007	2008	2009	2010	2011	2012	2013	2014
Electrification Ratio	64.3%	65.1%	65.8%	67.2%	73.0%	76.6%	79.3%	81.4%
RPJM Target				67.2%	70.4%	73.6%	76.8%	80.0%



Sumber : Kementerian Energi dan Sumber Daya Mineral, 2012

Key concept

- **Coordination** of individual actions is the key for optimizing ‘**big sum**’ (Olson, Jr. M, 1996)
- Need **institution** to make **property right secure** for the long term (Olson, Jr. M, 1996)
- “**Institutions** form the **incentive structure** of a society, and the political and economic institution, in consequence, are the underlying determinants of economic performance” (North, 1994)
- “**Time** as it relates to economic and social change is the dimension in which the **learning process** of human beings shapes the way institution evolve” (North, 1994)
- “the literature on collective action demonstrates (Olson, 1965; Hardin, 1982; Sandler, 1992; in Olson, Jr. M, 1996), **individual rationality is very far indeed from being sufficient for social rationality**” (Olson, Jr. M, 1996, pp. 23). **Collective action**

Key Understanding

- Every renewable energy resource has different requirements to optimize the flow of net benefits (solar PV, micro hydro, biomass, biogas). **Incentives structures-reduce transaction cost.**
- Site of renewable energy is constructed by different value, norm, and custom. **Need coordination-common understanding.**
- There is no one-size fits all, but **continue learning process.**
- Sustainable renewable energy supply. **Optimizing social benefits and cohesion.**

Community – Individual Ownership Rural Electrification Program

High engagement

1. Fully community ownership (Build-Training-Transfer)
2. Individual ownership (solar home system)

Medium engagement – revenue sharing – speciality base

1. Partially community ownership and NGOs/University/Research center
2. Partially community and state own company
3. Partially community and local government companies
4. Partially community and business sector

Low engagement

1. Fully state own company
2. Fully local government company
3. Fully business sector

Elements of engagement

- Land title – dispute settlement
- Formal – informal organization
 1. Maintenance and operation
 2. Supply sustainability (resource conflict -water)
 3. Collecting retribution
 4. Business & social activities
 5. Waste management (electronic waste)

Penetration of Renewable Energy

- High degree dependency on unreliable and expensive fossil fuel supply (topography, land lock, climate)
- Lack in electricity access – grid access connection take many years to come (if possible)
- Energy mix targeting and life style

Key successes

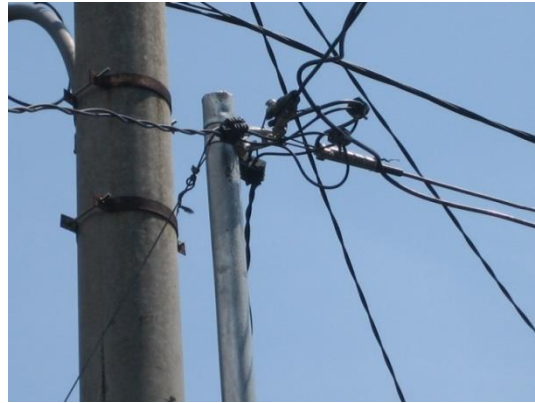
1. Net flow of benefits – people conserve
2. Benefits fairly distributed - cohesion
3. Partnership (speciality gains) – reduce risks
4. Backward and forward linkages with local economy – poverty reduction
5. No predatory program (credibility), lack in coordination – policy credibility





HUNGRY FOR MODERN ENERGY ACCESS





**RISKS
RELIABILITY
CAPACITY
SUSTAINABILITY**





Energy Poverty 2010

Region	Population without electricity millions	Electrification rate %	Urban electrification rate %	Rural electrification rate %
Brunei Darussalam	0.0	100	100	99
Cambodia	10	31	91	16
Indonesia	63	73	94	56
Laos	2.2	63	88	51
Malaysia	0.2	99	100	98
Myanmar	26	49	89	28
Philippines	16	83	94	73
Singapore	0.0	100	100	100
Thailand	8	88	98	82
Vietnam	2	98	100	97

Source: IEA (2012), *World Energy Outlook 2012*.

Population relying on traditional biomass for cooking

Regions and selected countries	Percent of population	Millions
Developing Asia	51%	1,814
India	66%	772
Bangladesh	91%	149
Pakistan	64%	111
Indonesia	55%	128
Philippines	50%	47
Vietnam	56%	49
Rest of developing Asia	54%	171
All developing countries	49%	2,558
World	38%	2,588

Source: REN21 (2013), *Renewables 2013 Global Status Report*

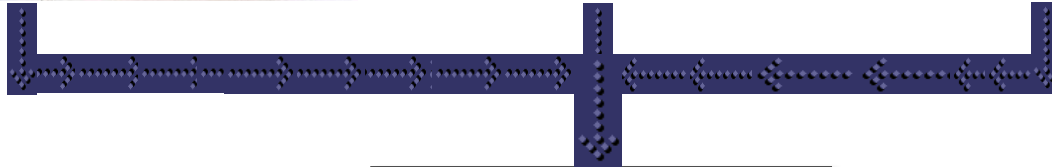
National Policy

- Energy Law No 30 Year 2007, the national energy management needs to improve energy access for poor people or to help they who live in remote area. Government provides energy fund for the poor and developes energy infrastucture
- Electricity Law No UU No. 30 / 2009 , central and local government provide fund for poor people, remote area, border area and rural electrification program.
- According to the Regulation of the Minister of Finance of 17 December 2012, **the special allocated fund for rural energy** in 2013 is provided. This fund needs to be used to **promote renewable energy** at the local level. The government allocates Rp 432.5 billion (US\$ 43.25 million). The budget for rural energy is about **1.7% of the total special allocated fund. It covers 95.227** targeted house hold
- The Ministry of Energy and Mineral Resources issued Regulation No 3/2013 on the technical guide for the utilization of the special allocated fund for rural electrification. The fund needs to be used for developing **new micro hydro power** (less than 1 MW), **rehabilitate micro hydro power** that cannot operate, the **extension and improvement of electricity services** from micro hydro power (off-grid), the development of **solar panels** (both concentrate and disperse), and **biogas installations** for households.

Saving Electricity and Cheap Program

On grid installation:

Home connection for housing, it covers meter equipment + 3 lamps + 1 stop contact.



A massive off and on grid (micro grid) solar PV program was stated in PLN's letter No. 1227.K/DIR/2011. There are two types of supply and utilization of solar PV, such as communal PV and autonomous (*mandiri*) PV. This program is called SEHEN, which stands for *Super Ekstra Hemat Energi* (Super Extra Energy Saving). There are two types of communal PV, such as PV communal-autonomous and PV communal hybrid

Communal PV	Autonomous PV
<ol style="list-style-type: none"> 1. Connected capacity Location is more than 5 km of PT.PLN's grid 2. Population density relatively high 3. Costumer has income to pay the electricity bill 4. Total capacity 220 VA 5. PT.PLN finances the program 6. Manage and supervise by PT.PLN 7. The property belongs to PT.PLN (except electricity equipment after the energy limiter) 8. Tariff for autonomous communal Rp 14.800 per month (plus connection fee). This follows the Presidential Regulation No 8/2011 (for S1 category) 9. Tariff for communal hybrid PV follows the Presidential Regulation No 8/2011 (plus connection fee) 	<ol style="list-style-type: none"> 1. Location is more than 10 km of PT.PLN's grid or it is isolated due to sea, river chasm 2. The location need to be close between on costumer and other 3. Costumer has income to pay the electricity bill 4. The capacity only enough for 3 LED with total capacity about 3 watt 5. Total capacity 12 watt 6. Technical life span 15 years for solar PV 7. Technical life span 10 years for LED 8. LED belongs to PLN 9. PT.PLN finances the program 10. This is a transition program before the customer is connected 450 VA 11. Manage and supervise by PT.PLN 12. The property belong to PT.PLN 13. Total monthly payment Rp 35.000 that consists of monthly fee (subscription Rp 14.800 per month) and rental cost of equipment Rp 20.200 per month)

SEHEN (SUPER EKSTRA SAVING ENERGY)



SEHEN PACKAGE :

1. Solar modul Solar Cell 10 Wp – 20 Wp (poly/monocristaline)
2. 3 set of lamps 3 W – 12 Vd (200 lm) + battery
3. Cabel instalation + acessoris
4. 1 Unit remote control



NO	Region	Customer
1	Kalimantan Timur	3,293
2	Maluku dan Maluku Utara	249
3	Papua dan Papua Barat	12,069
4	NTT	115,434
TOTAL		131,045

Solar Hybrid LEMBATA 200 kWp

