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Opportunities & Challenges for Renewable Energy Development in Indonesia

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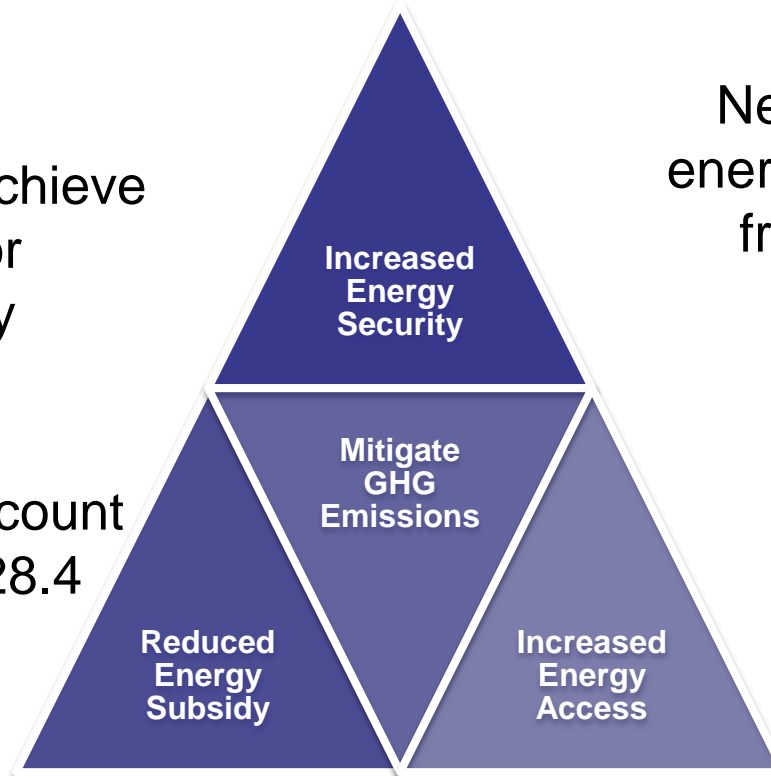


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Major challenges facing Indonesia's energy sector

GHG emissions to achieve 26% (41% with donor support) reduction by 2020.

Energy subsidies account for 3.8% of GDP or 28.4 billion in 2013.



New and renewable energy supply to grow from 5% to 23% by 2025.

Electrification ratio to grow from 80% to 90%, current demand growth = 8% per year.

Renewable energy and energy efficiency can address all these issues. However, the potential contribution faces a number of key challenges.



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Overview of Current Programs

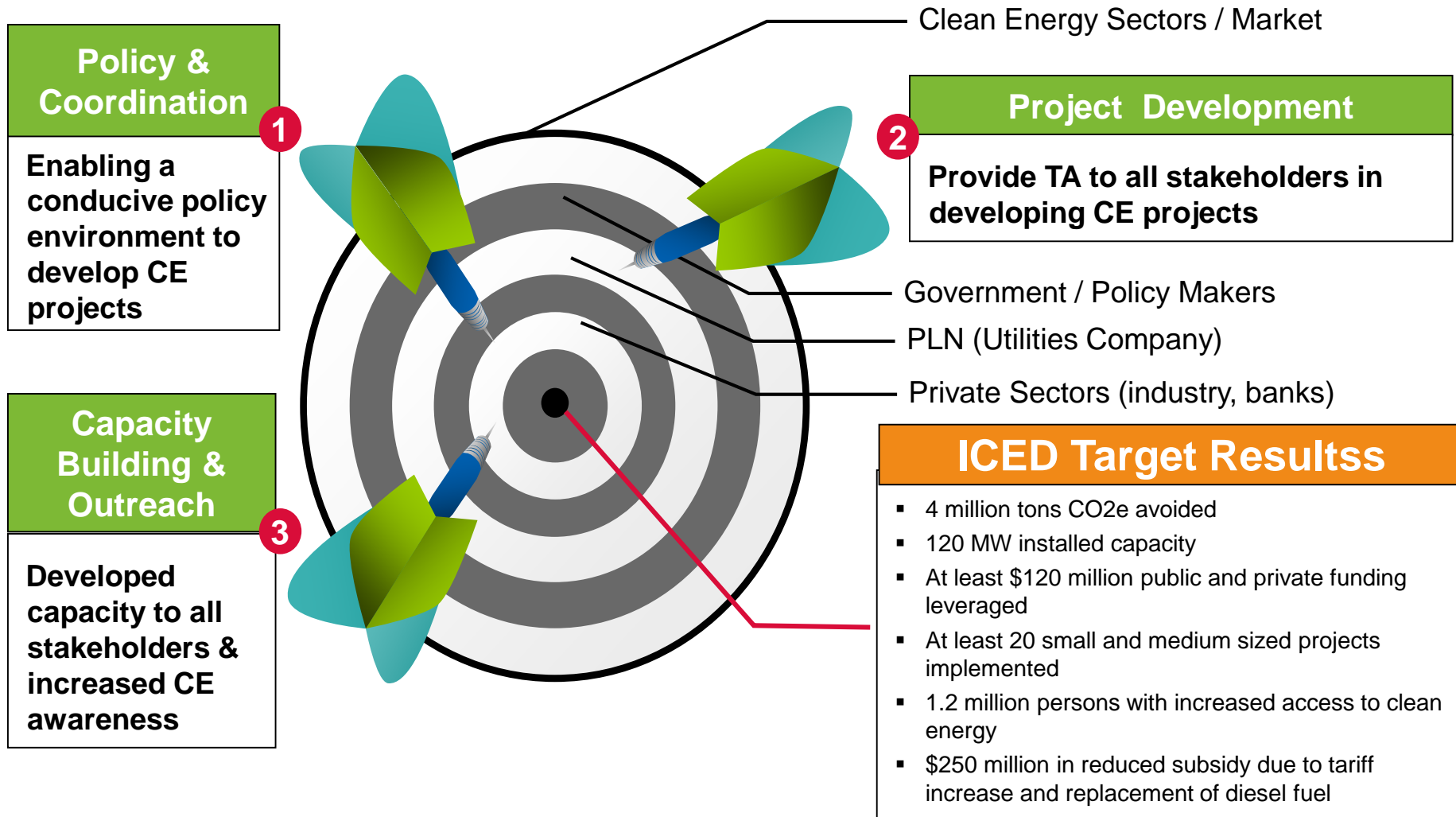
USAID/Indonesia – Clean Energy Portfolio 2011-2014

Programs	Period of Implementation	Implementing Partner
Indonesia Clean Energy Development (ICED)	2011-2014*)	Tetra Tech ES.
Capacity for Indonesian Reduction of Carbon in Land Use and Energy (CIRCLE)	2011-2014	Winrock Intl.
Utility Exchange Partnership Program – PLN & Hawaii Electric Company (HECO)	2013-2014	U.S. Energy Association
University Partnership - Geothermal Education Capacity Building Program	2011-2015	University of Southern California & Institut Teknologi Bandung (with support from Star Energy)

**) recently extended to February 2015*



ICED Approach in Developing Clean Energy Sector





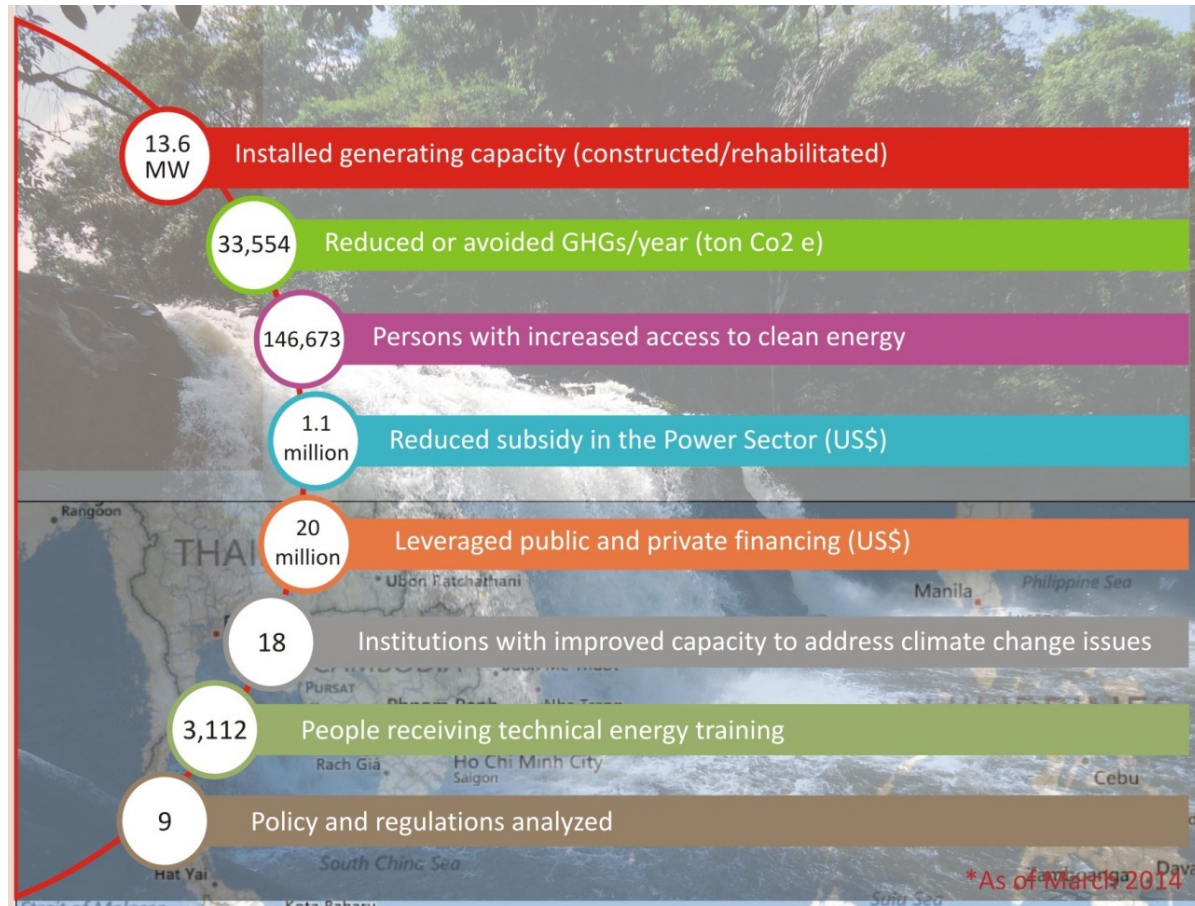
Project in Pipeline (under development)

- **107** projects (hydro, biomass, biogas, wind, energy efficiency)

Potential Impacts:

- **799.3** MW of generating capacity
- **3.2** million tons of CO₂e reduced annually
- **97.4** million tons of CO₂e reduced over projects' lifetime
- **9.3** million persons with increased access to clean energy
- **\$289** million in reduced subsidy for electricity per year
- **\$1.7** billion in leveraged private sector financing

Actual results to date





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Project Location



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Project Title:
Indonesia Clean Energy Development (ICED)
Project Database

Date:
31 March 2014

TYPE	Cnt_TYPE	MW
■ BIOGAS	15	45.80
■ BIOMAS	17	137.20
■ EE	3	0.00
■ HYDRO	67	399.00
■ WIND	5	217.30
Total	107	799.30

0 115 230 460 690 920 Kilometers

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

- Resources:
- ICED Pipeline
 - Projects Site Visits
 - Feasibility Study Document





1) Domestic small scale clean energy market is growing fast

- Significant growth of projects under development in the last 3 years; *ICED's project pipeline grew from 19 to 100+ between 2012 and 2014.*
- Introduction of new technologies: biogas, solar pv, wind, municipal solid waste.
- Increased interest and capital availability from domestic banking and non-banking financial institutions; *the domestic green financing portfolio grew from Rp 6.4 Trillion (2011) to over Rp 15 Trillion (2013) – Bank Indonesia's survey 2013*
- Improved capacity of key players: project developer, PLN (regional), banking officers (loan, risk)



2) New initiatives impacting clean energy development both directly and indirectly

- GHG emission reduction target/action plan (RAN/RAD GRK) drives improvement in regional energy planning and cross-sectoral coordination.
- Bank Indonesia/OJK – Ministry of Environment's Green Banking/Sustainable Finance joint program.
- Ministry of Agriculture's Indonesia Sustainable Palm Oil (ISPO): POME for energy generation
- Local government initiatives to address energy challenges:
 - North Sumatera Government preparing for RUED planning
 - Makassar Municipal Government's EE pilot project in government buildings
 - Riau district governments' focus in developing locally available bioenergy resources from palm oil mills



1) Alignment and streamlining of GOI's policies, regulations and incentives

- a. Necessary incentives to support private investment:
 - Government targets are set but lack of clear understanding of the policies and programs needed to achieve results.
 - Subsidized energy prices distort the market for renewable energy and energy efficiency.
 - Government incentives (e.g., feed in tariffs, tax incentives) are insufficient to stimulate rapid private sector investment.
 - Critical issues: licensing/permits, complementary scheme for FiT, implementable fiscal/tax incentives, bankable Power Purchase Agreement.
- b. Capacity of local government to implement and align national programs with local development authorities:
 - National clean energy programs lack the guidelines and capacity for local authorities to implement
 - Local autonomy not aligned with or supportive of National policies



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Challenges in Accelerating Clean Energy Growth

2) Domestic clean energy industry lacks the experience and capacity to develop feasible/financeable projects

- Banks/financial institutions do not fully understand risks and therefore rely on corporate credit and excessive collateral.
- Lack of capacity and standard procedures in regional PLN offices in assessing and processing proposals from project developers.
- Poor quality of services from local supporting engineering and consulting companies
- **Infrastructure challenges to support distributed generation and rapid renewable energy integration to grid**
- No successful business models for energy services/energy efficiency contracting.



Risks Associated with Developing and Operating Renewable Energy Generation Plants:

- Location of distributed REGPs (e.g., hydro, biogas) is far from existing distribution lines requires high interconnection costs
- Distribution line capacity limits availability for REGP output or requires redundant lines to connect to substation
- Impact of multiple REGPs connected to same circuit not assessed
- Power Purchase Agreement (PPA) signed without determining true cost of interconnection or limitations in sales to PLN
- PLN Regional Offices (ROs) do not use common approach when negotiating interconnection in PPA
- Availability of REGPs limited by voltage fluctuations on long 20 kV feeder lines



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Objectives & Purpose of the Guidelines

- To ensure connection and parallel operation of REGPs do not adversely affect the safety, reliability and power quality of PLN's power system.
- To facilitate implementation of the Government regulations on development of renewable energy generation.
- Provide streamlined procedures for:
 - REGP developers to prepare REGP connection applications, and carry out necessary connection studies;
 - PLN to review, and approve connection applications and studies, and seek ESDM's initial approval for proceeding with the process for direct procurement of REGP power.
- Provide REGP developers with clear guidance in performing connection studies and technical requirements for consideration early in the REGP project planning and development stages.
- Provide useful reference connection technical information to REGP engineering firms, equipment manufacturers, suppliers and accredited testing and certification agencies.
- Standardize the approach and methodology used by PLN ROs.



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Applicability

- Applicable to all new REGPs no larger than 10 MW in capacity to be connected to PLN's distribution system at 20 kV or lower voltage level.
- Also applicable to major refurbishment/modification of existing REGPs already connected to PLN's distribution system.



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