

Renewable Energy & Sustainable Development in NTT *Seminar & Workshop Objectives & Activities*

Hotel Kristal, Kupang, Indonesia, 8 Juni 2010

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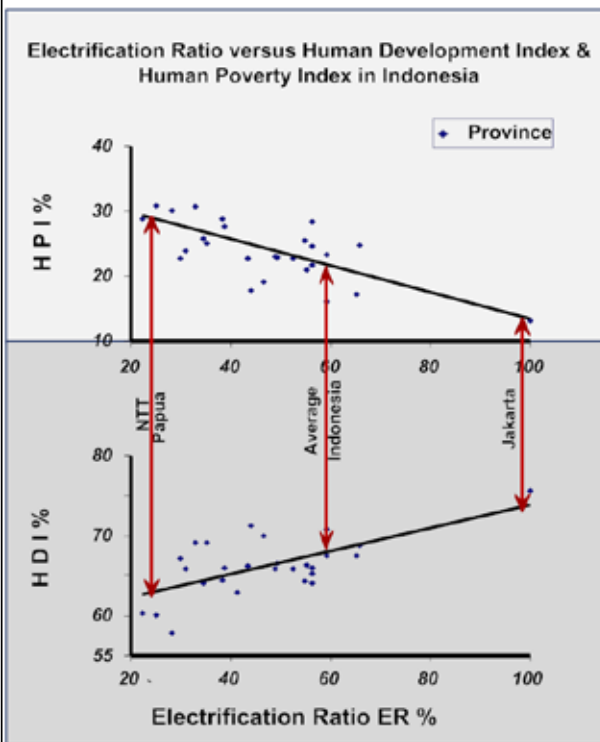
Seminar & Workshop Objectives

- Memfasilitasi komunikasi dan networking antar stakeholder EBT
- Berbagi informasi & pengalaman mengenai EBT, baik yang berhasil maupun tidak di NTT, Indonesia maupun dunia
- Melakukan update mengenai potensi EBT di NTT serta kendala yang dihadapi untuk implementasi dan pengembangannya, baik dari dimensi institusional, finansial, teknologi, sosial maupun lingkungan
- Memformulasikan rekomendasi strategi & kebijakan EBT untuk NTT
- Mendokumentasikan hasil diskusi agar bisa digunakan sebagai referensi untuk formulasi strategi & kebijakan EBT, serta untuk tujuan pendidikan EBT dan pembangunan sosioekonomi di NTT.

Presentasi & Pembahasan:

- Update mengenai masalah energi yang dihadapi oleh NTT saat ini, potensi yang dimiliki, kendala yang dihadapi, strategi implementasi & rencana kedepan untuk mencapai situasi pelayanan yang terjangkau, handal & bisa menjadi kunci untuk pembangunan NTT
- Mengenai potensi & kendala tersebut diatas, bahasan ditinjau dari dimensi **instutional** (regulasi, organisasi, administrasi dll), **finansial** (anggaran, harga energi, investasi, subsidi, dll), **teknologi** (jenis teknologi yang sesuai/yang dipilih untuk situasi NTT dll), **sosial** (peran energi untuk pembangunan sosial di NTT, respon masyarakat terhadap EBT, pendidikan, training, pemberdayaan masyarakat, dll), **lingkungan** (manfaat & dampak)

Electrification Ratio & Socioeconomic Development in Indonesia ER, HDI & HPI Correlation



Population 238m **Electrification Ratio:** 60%,
Average kWh/capita: 564 (NTT- 74; Jak- 2077).

Current Situation: Demand growth 9%/year;
Supply growth: 3-4%/year leading to electricity
crisis; Oil share for electricity generation 63%

Future Target: 80% Electrification ratio (2014);
no more black out (2010); decreased oil usage

HDI: Life expectancy, educational attainment,
living standard

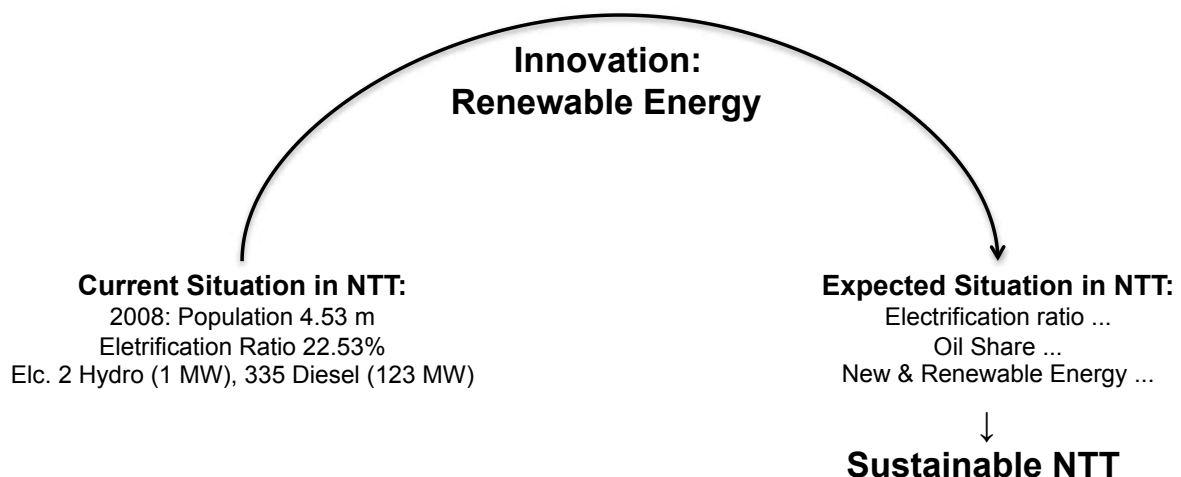
HPI: Poor health, illiteracy, poor access to clean
water and earning below a dollar a day

(PLN 2008, UNDP 2008, CIA 2008, BP PEN 2006, Sulistomo 2010)

PLN 2008, Indonesian Electricity Statistics 2007 ; UNDP 2008 Human Development Reports, <http://hdr.undp.org> ; CIA, 2008, The World Fact Book, Indonesia, www.cia.gov

3

Change, Innovation & Diffusion of Innovation



Diffusion of Innovation: “The process in which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p5).

Innovation: “An idea, practice or object that is perceived as new” by its adopters (Rogers 2003)

Renewable Energy & Sustainable Development



A 120 kW Micro Hydro system in West Java (2005), a cross-flow MH turbine produced by Heksa Hydro in Bandung (2009), a PV-Wind-Diesel hybrid system in Rote Island, NTT (2005), PV entrepreneur in Lampung (2005), 60 MW Geothermal Power Plant in Kamojang (2009), STTNAS Study Tour to facilitate RE capacity building in Indonesia (2009)

5

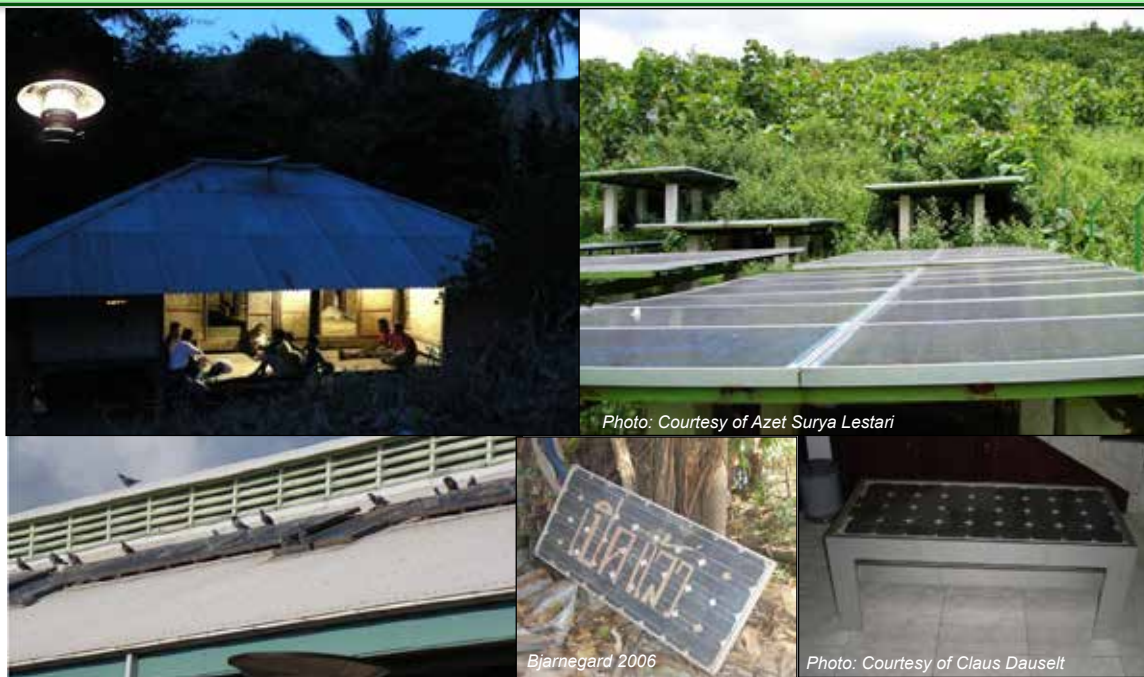
Innovation (RE) Challenges



Wollongong 2008: Wave power at Wollongong harbor
West Timor 2009: Micro Hydro installation, wind power water pumping system

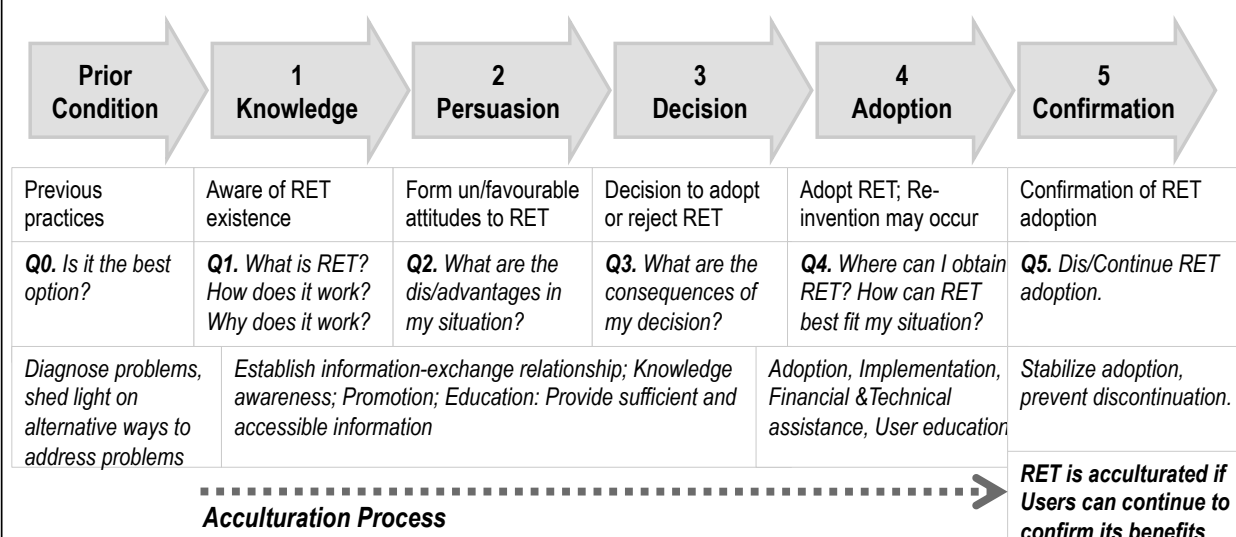
6

Innovation (RE) Challenges



Institutional: Lack of adequate after sales service infrastructure; **Financial:** Poor fund management; **Technological:** Lack of spare parts and technician availability; **Social:** Externally derived problems on rural communities leading to social fragmentation; **Ecological:** Inadequate RE waste handling, RE unsuitable in some local physical environments

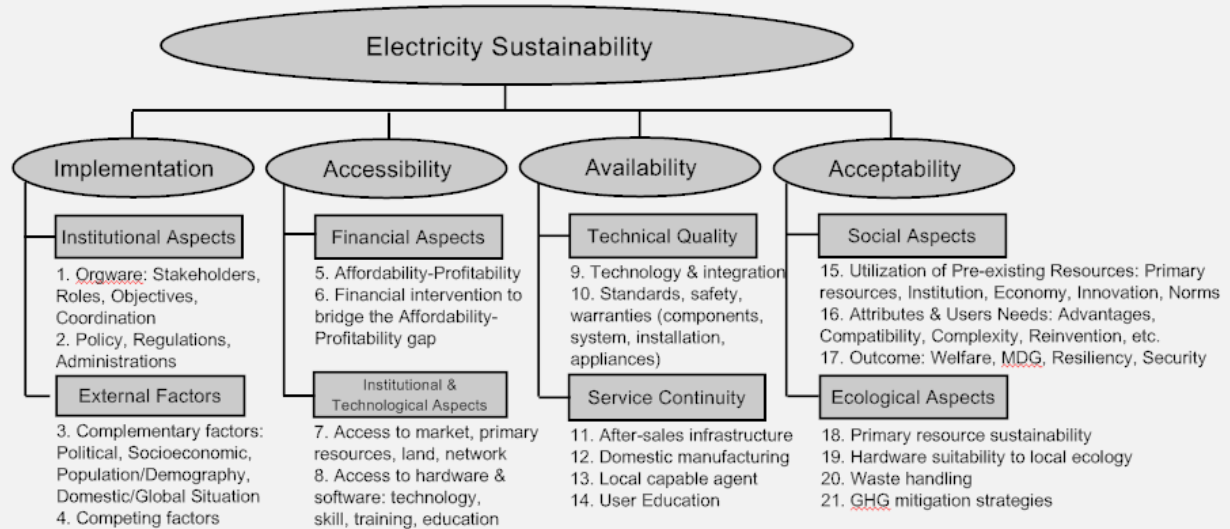
Exp: The KPDAC Continuum & Acculturation Process of RET



The KPDAC continuum:

- Interweaving of hardware-software-orgware that explains the what, why, who, how involved in the RET acculturation process, as well as its success or failure
- Hardware: Equipment, Software: Skill, information, Orgware: Institutional context

I3A Framework: Electricity Services Sustainability



I3A Framework: An **implementation** that maintains energy service **accessibility** (financial, institutional, technological), **availability** (technological, institutional) and **acceptability** (social, ecological), considering the hardware, software and orgware aspects of energy service delivery during & beyond initial project life (Retnanestri 2007)

Retnanestri, 2007, The I3A Framework – Enhancing the Sustainability of Off-grid Photovoltaic Energy Service Delivery in Indonesia, PhD Thesis, <http://unsworks.unsw.edu.au/vital/access/manager/Repository/unsworks:1598>

9

Innovation Social System: Stakeholders Synergy, Objectives, Roles, Relationships, Active Participation



Social System: “A set of interrelated units that are engaged in joint problem solving to accomplish a common goal” (Rogers 2003, p23).

Stakeholders may have different objectives! Civic network imperative! Beware social field!

• **Civic Network** is characterized by consensus, active involvement of well-informed and capable participants, and good governance based on trust, norms and obligations among its members

• **Social field:** Battleground of differing interests

Role of facilitator as channel, linker, communicator, catalyst:

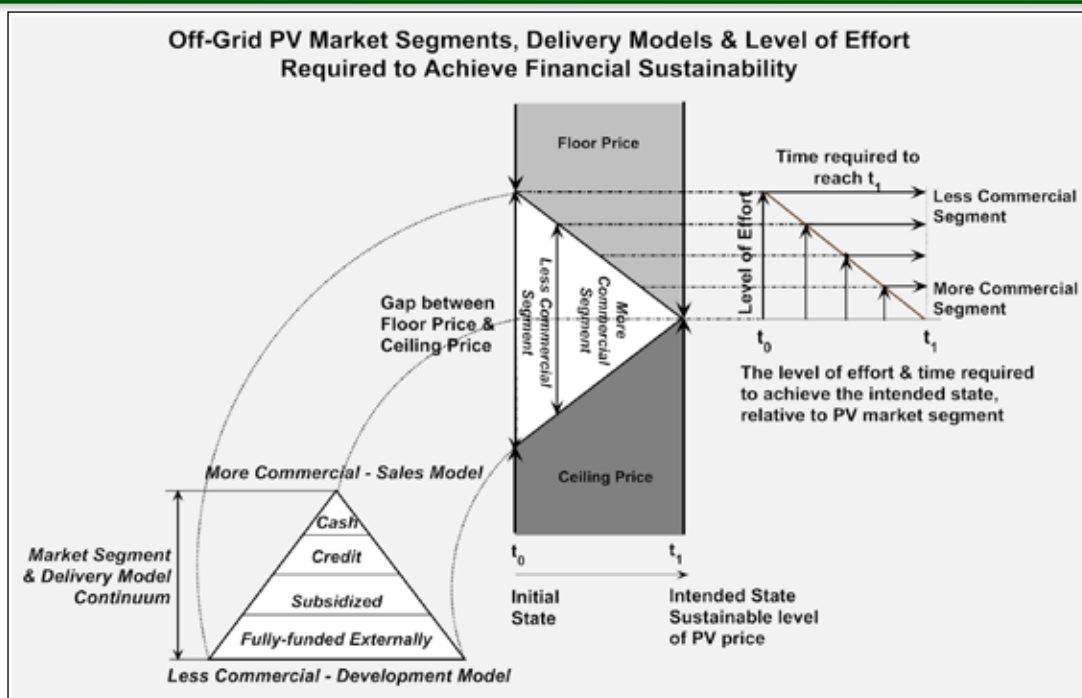
▪ Secure innovation adoption in the direction deemed desirable by Sponsor, balancing this with Users requirements

▪ Acknowledge all stakeholders interests, promote civic network, local governance, community autonomy (capacity building required)

10

Financial Accessibility & Community Empowerment

Bridging Affordability – Profitability Gap; Example Off-grid PV

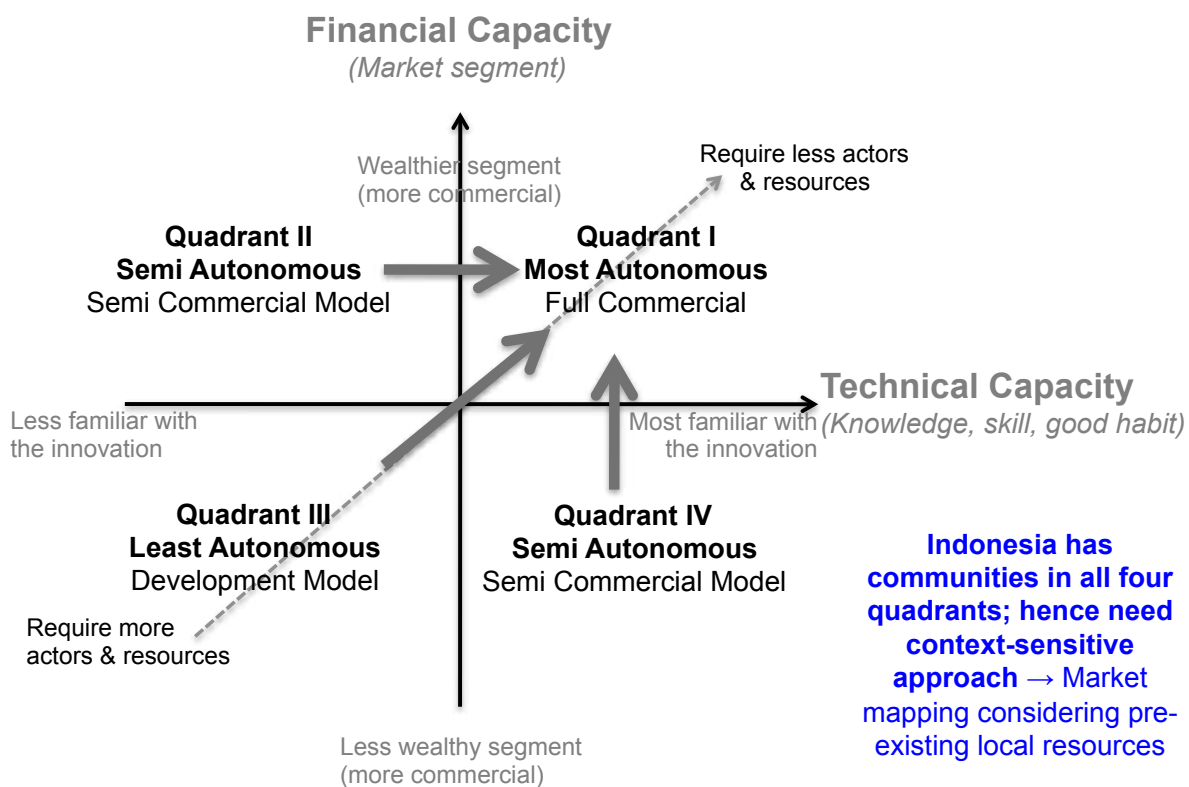


Generalization: Need relevant delivery approach for different market segment, market mapping required:

- **Commercial:** Market facilitation to bridge the Affordability - Profitability gap
- **Less-commercial:** Community empowerment; Empower users to be able to become part of the merchant society; Active adopters rather than passive recipients of innovation

11

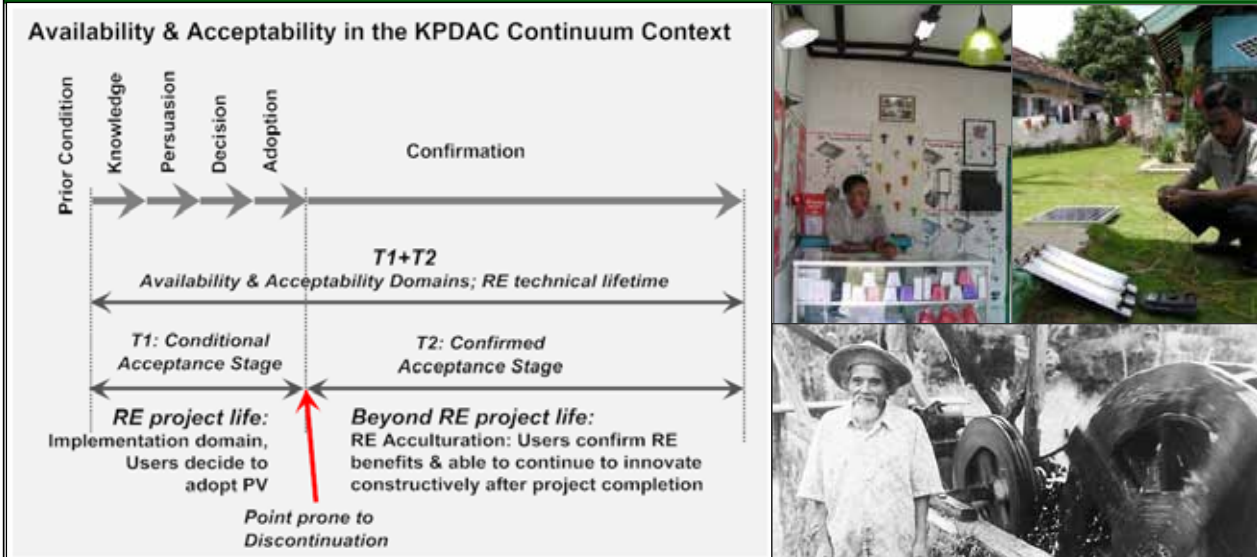
Community Empowerment & Autonomy Building



12

Availability & Acceptability: During & Beyond RE Initial Project Life

Example Off-grid PV & Micro Hydro



T1 & T2 Availability: Confidence in technical quality & continuity of energy service delivery (technical standards, after sales service infrastructure)

T1 & T2 Accessibility: Conditional & Confirmed Acceptance → Acculturation of energy service technology into local community's life

13

Workshop Activities

- Participants break into a group of up to fifteen people from mixed-background (government, academics, business, NGOs, etc). Each group is tasked with the following:
 - Identify the renewable energy resources in NTT
 - For each of the relevant resources & technologies, identify the institutional, financial, technological, social & ecological barriers to achieving energy accessibility, availability & acceptability and ways to overcome them
 - Work through the “Methodology for Developing a Plan to Enhance the Sustainability of Renewable Energy Service Delivery in NTT in 21 Steps” [link]
- After completing these tasks, a group representative will present the outcomes to the plenary audience
- All of the group task outcomes will be compiled and presented as the recommendations of the seminar & workshop, and will be disseminated through the following website: <http://www.ipenconsulting.com.au>

14