

ACEF 2022

Session 1.1: National Energy Transition Roadmap and Government Action

**Local government action in Solar Photovoltaic (PV)
skill development to support national energy
transition target in Indonesia
A case study: Solar PV skills in East Nusa Tenggara
Province (NTT) Indonesia**

Presented by:

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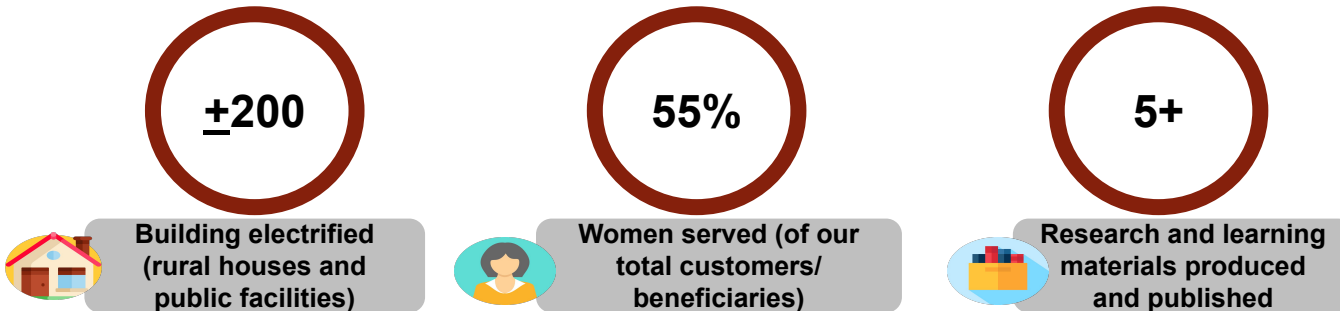
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Study was conducted in partnership with:







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RAKARU is actively engaging in introducing new, cost-effective, and impactful technologies to rural and urban areas in Indonesia with excellent technical capability. RAKARU is **unique for being the only company** that is able to provide systematized PV technology to the very remote area.



Nusa Tenggara Timur (NTT) profile



 Total Villages	 Number of electrified villages	 Number of un-electrified village	 Ratio of Electrified Village
3,353	3,204	149	95.56%

- NTT has **vast solar energy potential** and aims at becoming the solar energy barn (Lumbung Energi Surya) of Indonesia
- This requires **trained and locally available technicians** for planning, installation, operation and post-installation services such as maintenance and repair → nurtured through vocational schools and training centers
- The study mapped the supply-demand of solar PV in NTT. Data collection via desk research, survey, interview, focus group discussion and validation workshop

At the national level:

President's Decree No. 79 of 2014 with the target of increasing the renewable energy contribution to the national energy mix by **23%** by 2025 and **31%** by 2030

At the provincial (NTT) level:

Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) of PT PLN Persero:
solar PV is among the **top four renewable energy types to be developed** with solar eventually reaching a total of 180.51 MW

Rencana Umum Energi Nasional (RUEN) target for NTT province:
increase of total installed capacity from 4.2 MW in 2015 to **414.9 MW in 2025**

RUED 2019-2050 through Regional Regulation (Peraturan Daerah) Number 10 of 2019 concerning Guidelines for the General Plan of Regional Energy of NTT province for 2019-2050:

- The main goal is to achieving an electrification ratio of 80% to 90% by 2025, and towards **100% by 2050**
- The mandatory use of solar cells at a minimum of **30% of the total public street lighting**
- The mandatory use of solar cells at a minimum of **10% of the roof area of industrial complexes and commercial buildings, government buildings and other public facilities** through a Building Permit

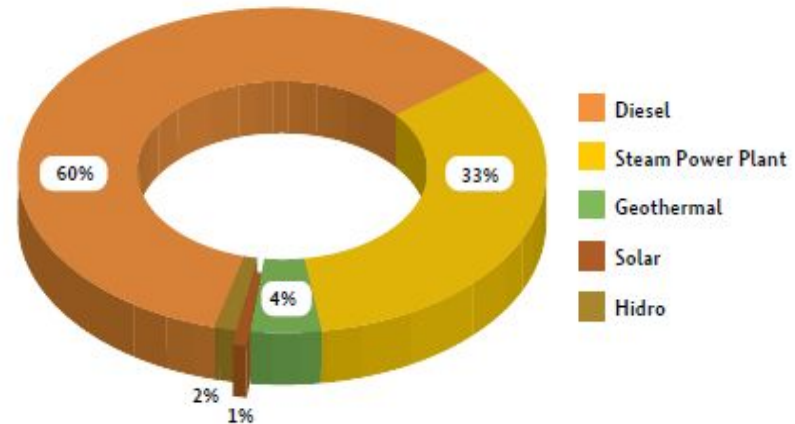
Strong dominance of fossil fuels

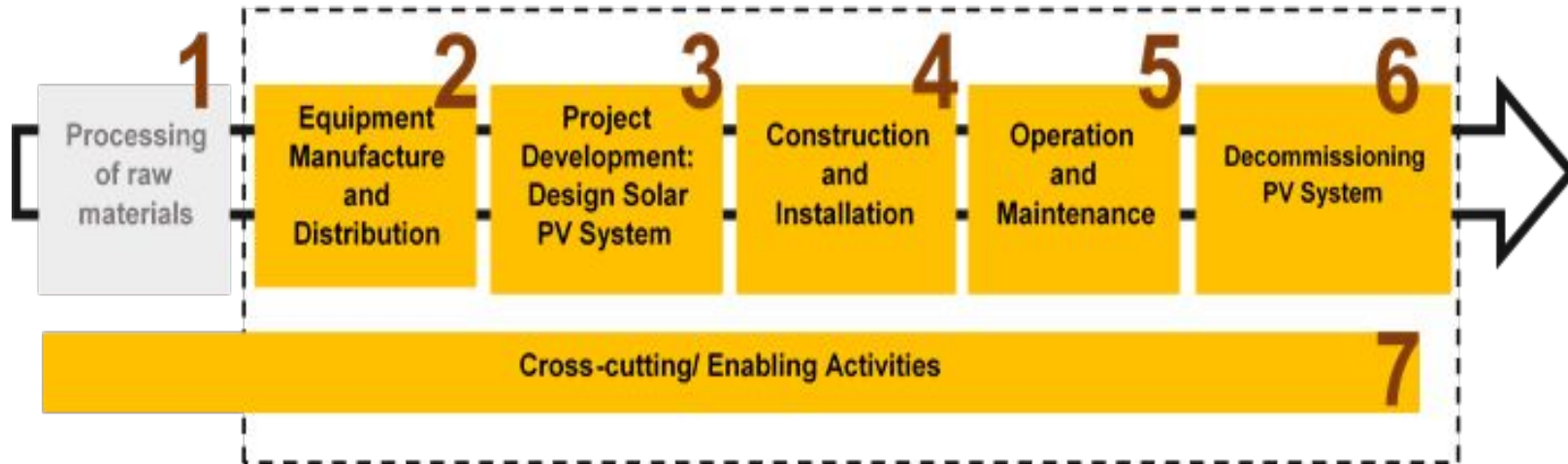
including diesel and steam power plants; both responsible for about 93% of the energy mix.

Low purchasing power.

This is the biggest business risk so far because it has the potential to hamper the growth of renewable energy

Lack of implementation of commitments at the local level





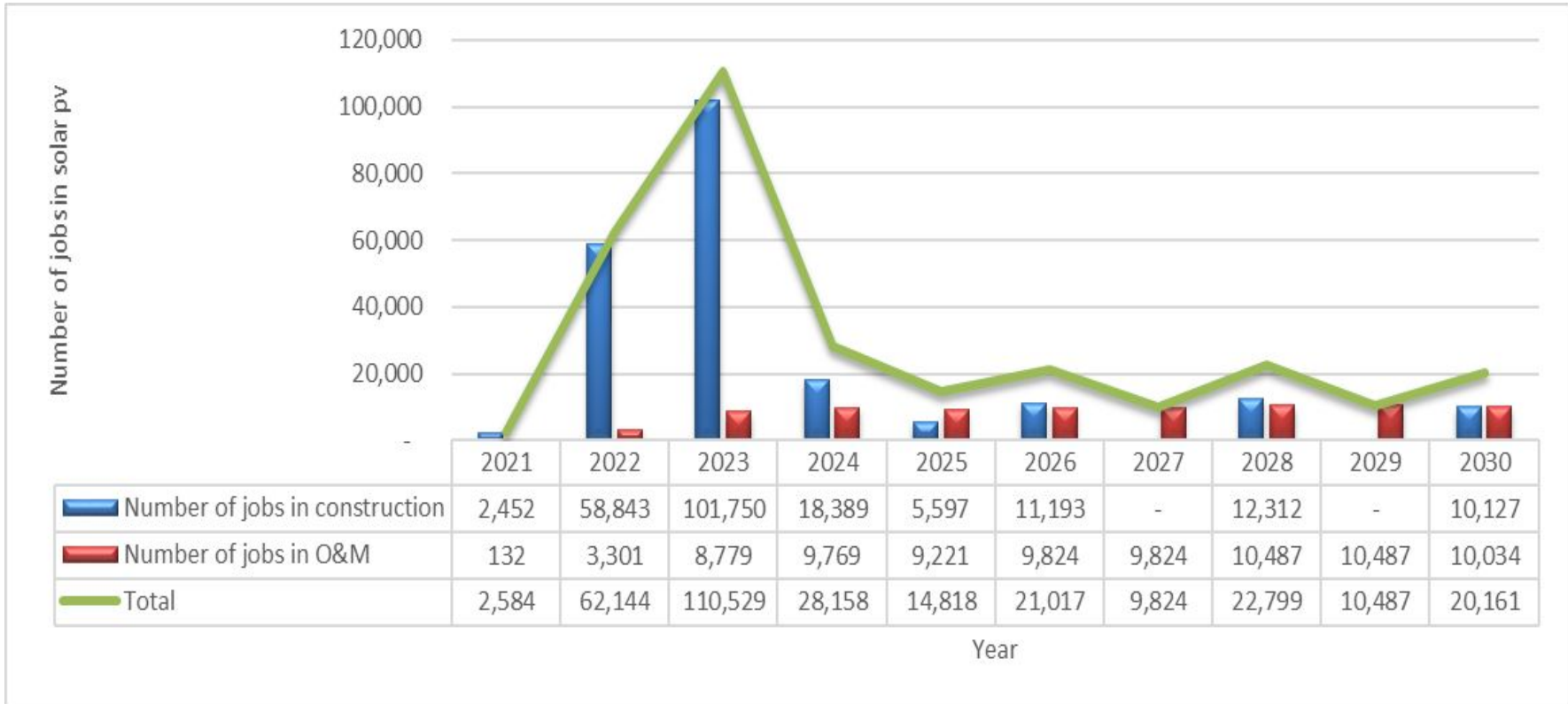
Note:

- currently, there is no institution performing raw materials processing in NTT (stage 1) as project equipment is usually imported from mainland Java or from overseas
- the institution respondents concentrate on implementing stage 2 to stage 7 only

- When classified based on activities, **design solar PV system (stage 3)** (88%), **construction and installation (stage 4)** (76%), **operation and maintenance (stage 5)** (76%), identified as the top three most conducted activities in NTT. However, this is not reflected in the absorption of local workers for these activities.
- The majority of positions that require high skills are occupied by non-local workers especially in Project development: solar PV system design (stage 3). **Local workers are mainly employed in positions requiring medium and low skills such as welders, masons, operators, and administrative personnel.**
- **The lack of locally-based and reliable O&M institutions** is often raised as one of the reasons that worry local users such as resorts and property management companies that adopt solar PV.
- More than half (53%) of the institutions currently operating in NTT state that **the absence of supporting local regulations and consumers' low purchasing power** are two main challenges that are limiting their expansion plans.
- **Limited human resources in NTT** where NTT does not experience a demographic bonus.
- **Lack of technical knowledge and local resource capacity** for solar energy sector development.

Employment Estimates in Solar PV Development in NTT

Estimated annual job in solar PV Construction, and Operation & Maintenance activities in NTT between 2021-2030



Human Resource Competencies currently **do not meet** the needs both internally for vocational education and for industrial needs.

In nutshell, there are two emerging issues related to the human resources needs for the PV industry with the availability of graduates (upcoming worker) provided by the vocational schools and training centers:

- The gap between skills and industry needs

Number of people working in NTT is 2,725 thousand with only 22% graduated from senior high school and 13% from university. **This condition has an impact on the productivity and competitiveness of the workforce which is relatively low.**

- Mismatch

The education and skills possessed by the workforce do not match the needs of the industry, causing the industry to experience difficulties in obtaining local quality workers.

- **Skill development of prospective workers needs to be adjusted to market demand/needs.** The provincial government may want to consider **to curate the content of the learning curriculum in vocational schools and/or training centers to be in line with skills related to plant and machine operators, electricians and technicians:**
 - NTT currently has a significant number of off-grid and distributed systems so related skills may be needed now and in the next 5-10 years.
 - Another trend is rooftop solar, local electricity grids for self use and solar street lighting. However, the lack of market players in NTT may hinder the adoption of this solution by potential customers. The government should not only focus on adopting solar rooftops but also ensure tenders are available for O&M.
- **The need to regulate provision of incentives on solar rooftops adoption installation,** for example the government implements a strategy of providing discounts or other mechanisms to encourage urban communities and industries to adopt solar rooftops
- **Training on solar PV targeting industries such as hotels, resorts, property agents, and others.** Our interview results show that many of them are highly interested but has lack of knowledge and worry about skills in installation and O&M; therefore these two skills are very important in developing PV mini-grid in NTT.

Thank you

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