



# **Innovative Finance for Sustainable Energy Access: Lessons from the World's First Result-Based Loans in the Energy Sector**

**Energy Evaluation Asia Pacific  
Bangkok 30-31 October 2019**

**Session 3.1 Innovation and the Demand for Evaluation**



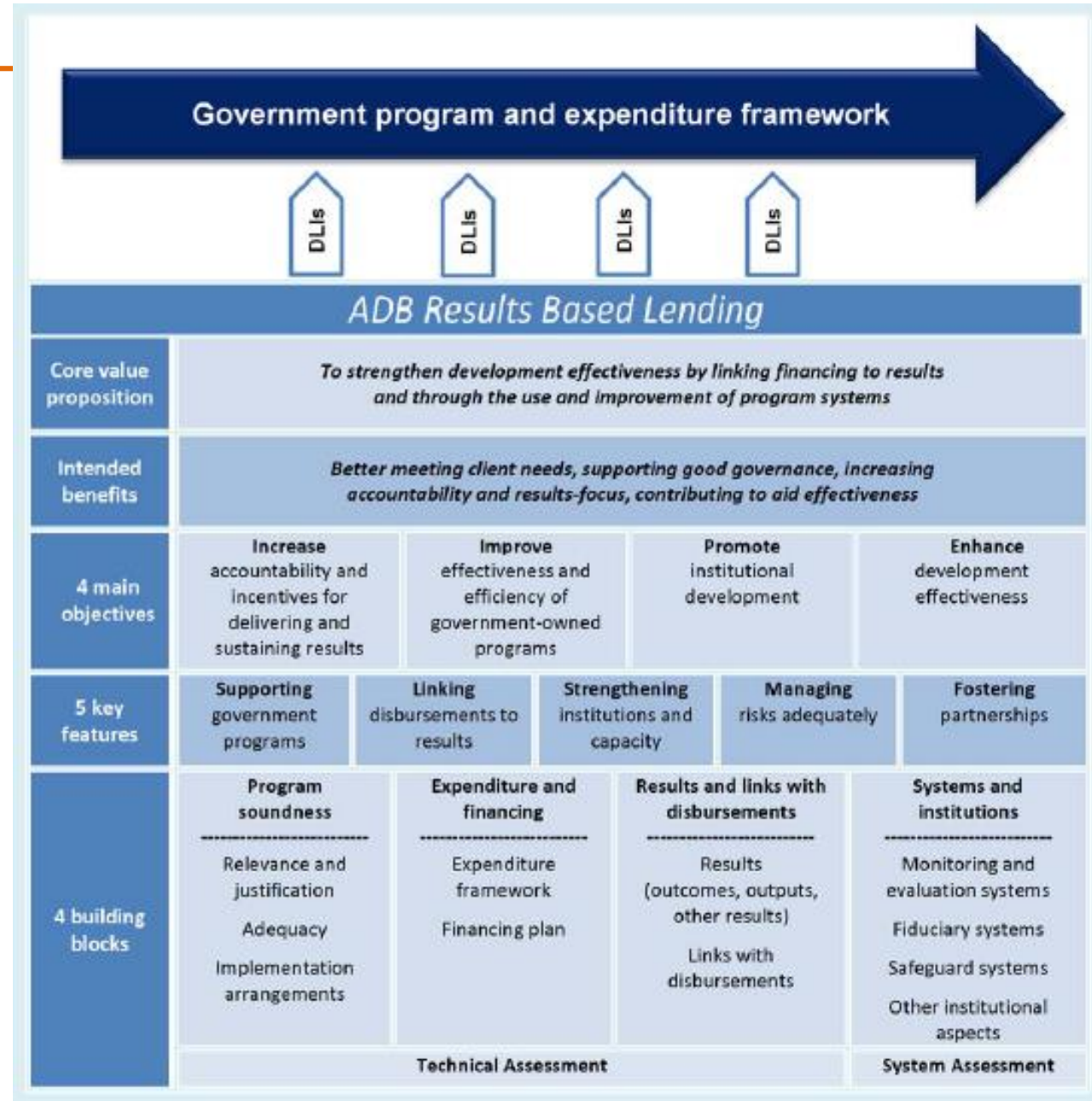
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  - M&E
  - Enhanced Reliability
  - Awareness increase in Environmental and Social Safeguard



# Result Based Lending Conceptual Framework



Source: Asian  
Development Bank  
Evaluation Department



# PLN Result Based Lending Programs: on-going

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## PLN Sumatera Power Distribution Expansion Program

- Program's period: 2015-2019
- The world's first result-based lending approach applied in the power sector
- Focus on adequacy and reliability of power supply in Sumatera (focus on residential)

## PLN Sustainable Energy Access in Eastern Indonesia

- Program's period: 2017-2021
- Focus on enhanced access to more reliable electricity services for residential, commercial, and industrial customers
- Supporting the medium term national development in inclusive economic and environmentally sustainable growth



# Disbursement Link Indicators and Program Action Plan

## Sumatera Power Distribution Expansion Program

Disbursement Link Indicators	
Outcome	Increased number of customers/year
	Residential sales growth/year
	Reduction of permanent interruptions/year
Outputs	Increased length of 150 KV transmission reconducted
	increased number of transformers/year
	Increased length of 20 KV MV lines

## Sustainable Energy Access in Eastern Indonesia

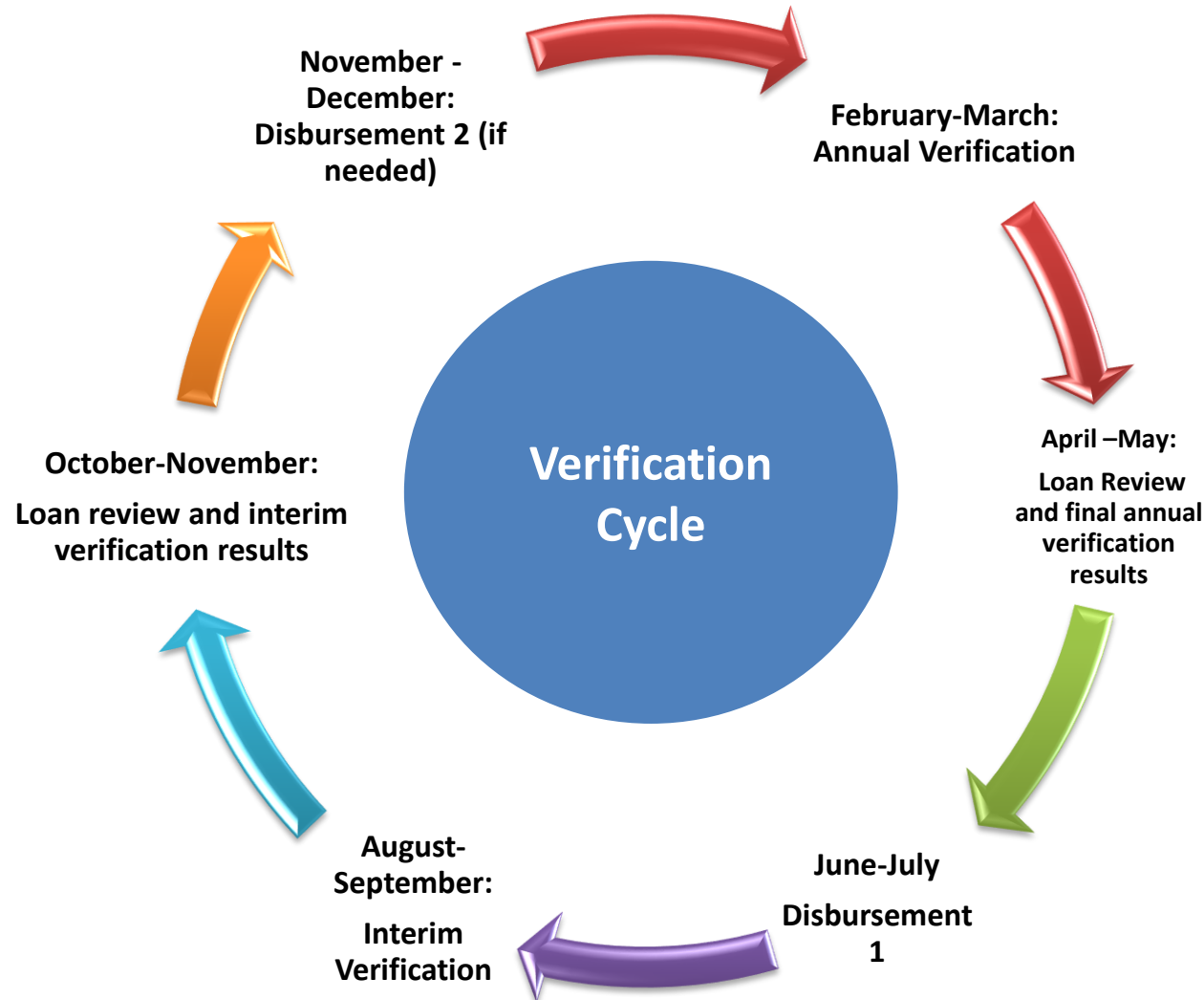
Disbursement Link Indicators	
Outcome	Increased number of customers/year
	Residential sales growth/year
	Reduction of permanent interruptions/year
Outputs	increased number of transformers/year
	Increased length of 20 KV MV lines
	Pilot-scale smart grid projects
	Increased use of digital pre-paid meter and smart meter
	Improvement of asset and waste management

**Program Action Plan:** To improve the program's design and implementation, strengthen the program's systems and institutions, increase agencies' capacity, and mitigate risks:

Technical aspects, Monitoring and Evaluation , Financial Management, Financing and partnerships, Procurement, Environmental and social safeguard



# Annual Verification Cycle



## Verification activities:

- Data gathering through PLN's own system: M&E, project evaluation, procurement, safeguard
- Interview with PLN: Headquarter, UIW (wilayah) and ULP (area) level
- Site visits, physical inspection

**Close Collaboration with PLN team**





# Progress: Outcome and Disbursement

ADB RBL DLI Sumatera Distribution Expansion Program	Baseline 2014 (verified)	IVA verified achievement 2018	ADB RBL DLI Sustainable Energy Access in Eastern Indonesia	Baseline 2016 (Verified)	IVA verified achievement 2018
<b>DLI #1:</b> Number of PLN customers in Sumatra increased by an average annual rate of at least 5.6 % to reach at least 13.88 million customers by 2019	11.8 million	14.18 Million	<b>DLI #1:</b> number of total customers increased by an average annual rate of at least 5.6% to reach at least 6.99 million customers by 2020	5.62 million	6.59 million
<b>DLI #2:</b> Residential energy sales increased by an average annual rate of at least 8.5% to reach at least 21,931 GWh by 2019	15,850 GWh	18,923 GWh	<b>DLI #2:</b> total annual electricity sales increased by an average annual rate of at least 8.5% to reach at least 15,710 GWh by 2020	11,336 GWh	12,711 GWh
<b>DLI #3:</b> Number of medium-voltage feeder permanent interruptions /100 km Medium voltage maintained at 2014 baseline level or improved	21.34/100 km	15.43/100 km	<b>DLI #3:</b> Feeder line permanent interruptions in the distribution system reduced by an average annual rate of at least 5% each year to reach less than 15.82/100 ckm by 2020	19.92/100ckm	13.18/100 ckm

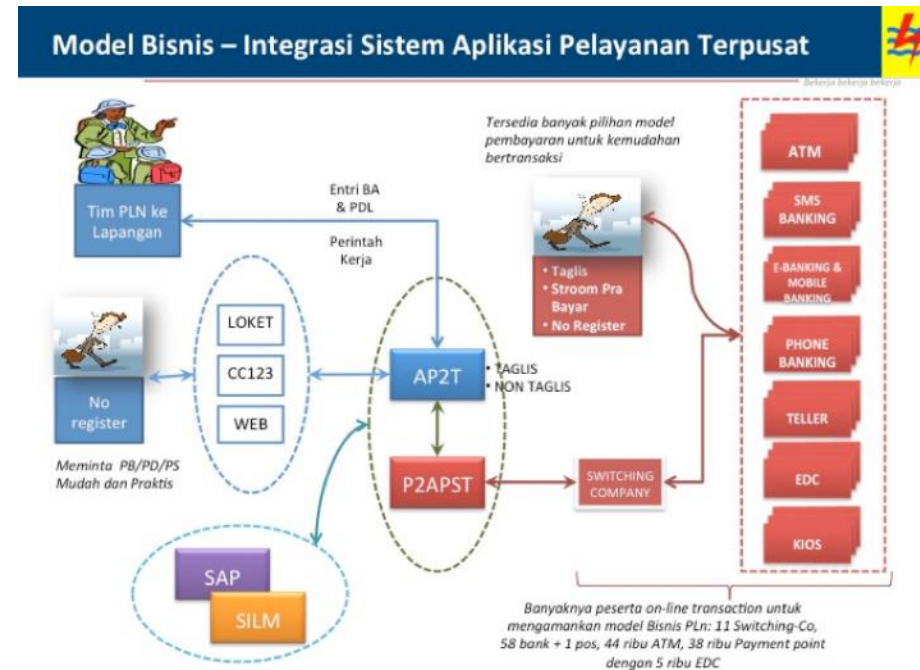
RBL Sumatera: approximately 95% loan has been disbursed by June 2019

RBL Sulawesi and Nusa Tenggara: 56% loan has been disbursed by end of December 2018



# Key findings: M&E system

- PLN has excellent monitoring system on indicators related to sales and budgeting (AP2T, SAP and SILM integration);
- Continuous progress in development of procurement monitoring system and integration of procurement, expenditures, budgeting
- Requires strengthening in asset management, inventory of assets, and social and environmental safeguard



LAPORAN PENJUALAN ALIRAN LISTRIK (FORM TUL III-09) WILAYAH S/D BULAN

PT PLN (PERSERO) WILAYAH NUSA TENGGARA BARAT  
Desember 2017  
CARUNGAN

Wilayah: PT PLN (PERSERO) WILAYAH NUSA TENGGARA BARAT  
Bulan: Desember  
Tahun: 2017  
Pembayaran: CARUNGAN

GOLONGAN TARIK	Jumlah Pelanggan	Pangsa (%)	Rasio (%)	Pangsa (%)	PEMANGGUP / MELAKSI 100%				PENGANGGUP RUMAH
					Jumlah	Pangsa (%)	LOSEP	WSP	
5.1/230 V	0	0,00	0	0,00	0	0,00	0	0	0
5.2/400 V	1	0,00	0,00	0,00	0	0,00	0	0	0
J	1	0,00	0,00	0,00	0	0,00	0	0	0

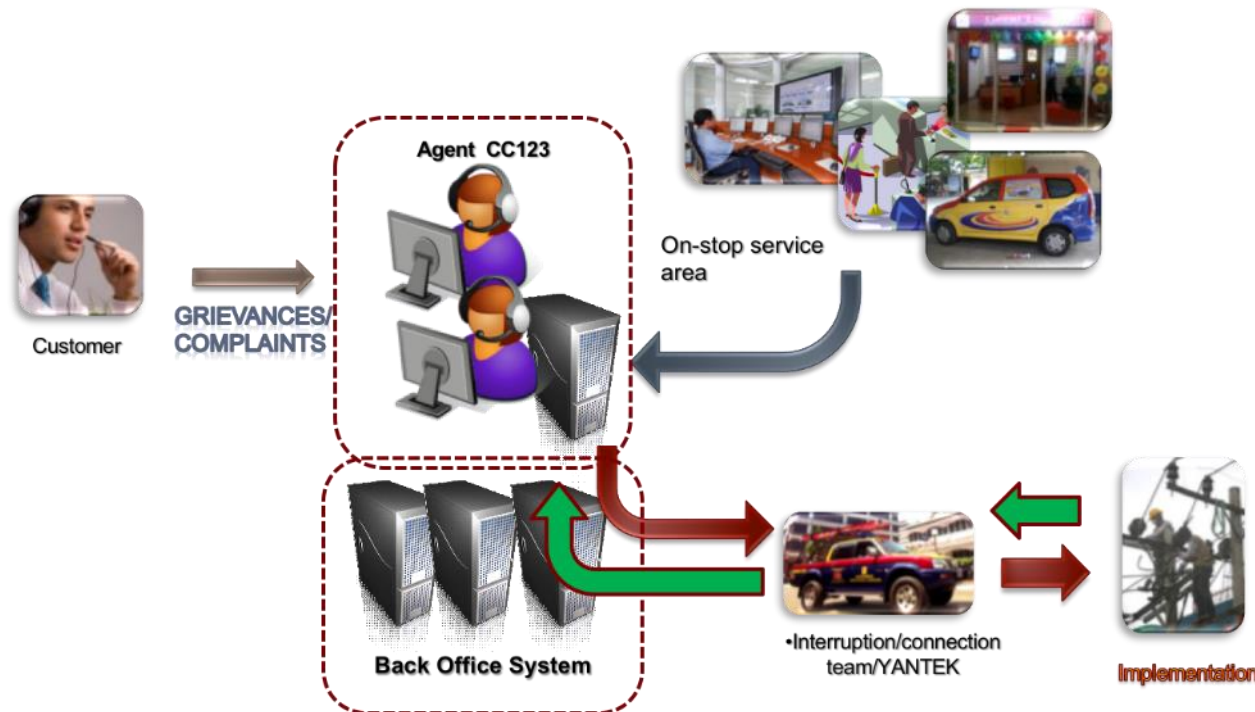




# Key findings: Innovation for Reliability Improvement

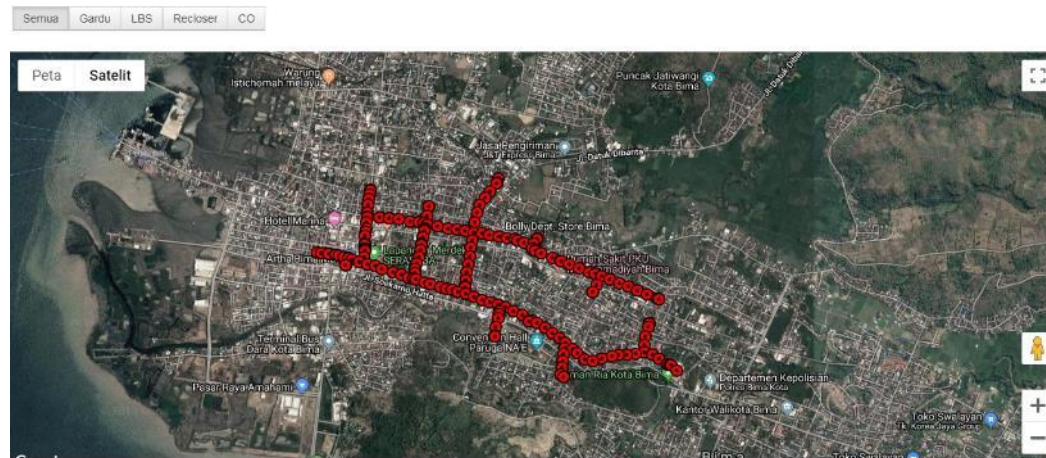
Reduction of Permanent Interruptions and SAIDI/SAIFI due to:

- Enhancement of monitoring system using integrated APKT (Customer complaint recording and reporting) with SCADA at Distribution Control Center (DCC)
- Innovation with GIS tools at certain PLN area (ULP)

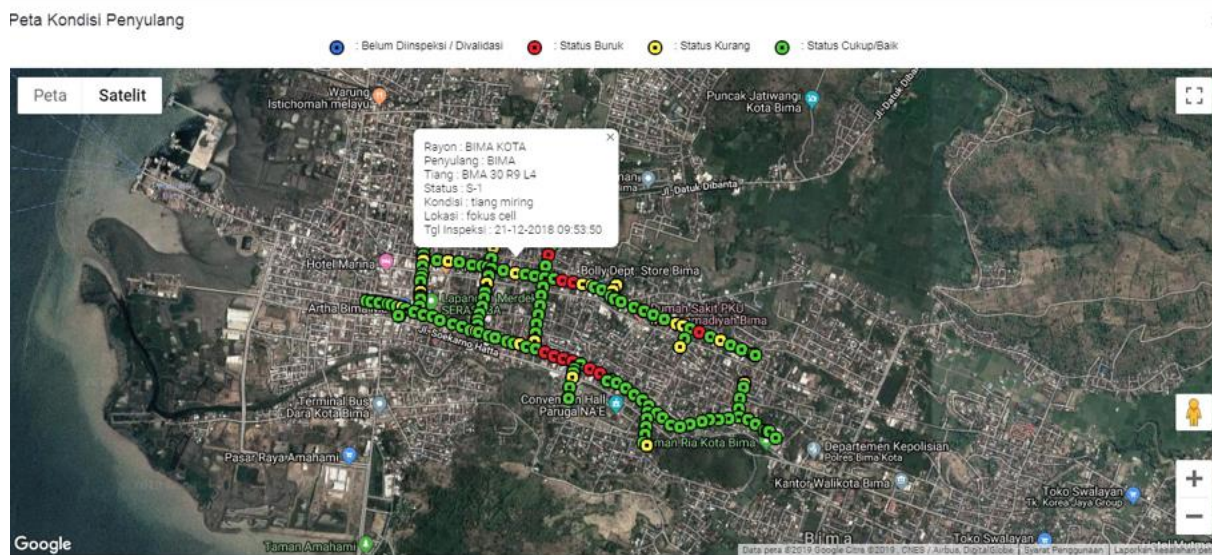


**Workflow Customer Complaints/Grievances (APKT)**

# Innovation with GIS tools



Feeder mapping



Inspection results

Work order for  
interruption/O&M  
team (YANTEK)



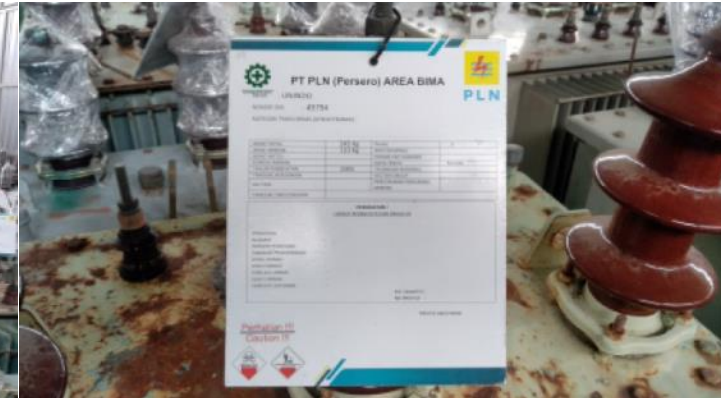


# Key findings on Env Safeguard: Gradual Improvement on Waste Management

- Proper storage on wooden palettes on concrete flooring



- All used transformers are clearly labelled



## Lesson's learned

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- Holistic approach in determining KPI is required with a balanced focus between commercial aspects and sustainability aspects (e.g., environmental and social safeguard, asset inventory and management)
- It takes time for behavioral changes
  - Gradual changes are seen during the course of the programme, and it requires more time in certain aspects, e.g., environmental and social safeguard
- Synchronization of data between different management layers might need regular independent check besides internal QC/AC
- Raise awareness of PLN on market evolution: from increasing access towards improvement of reliability as electrification ratio exceeds 90% nationwide

