

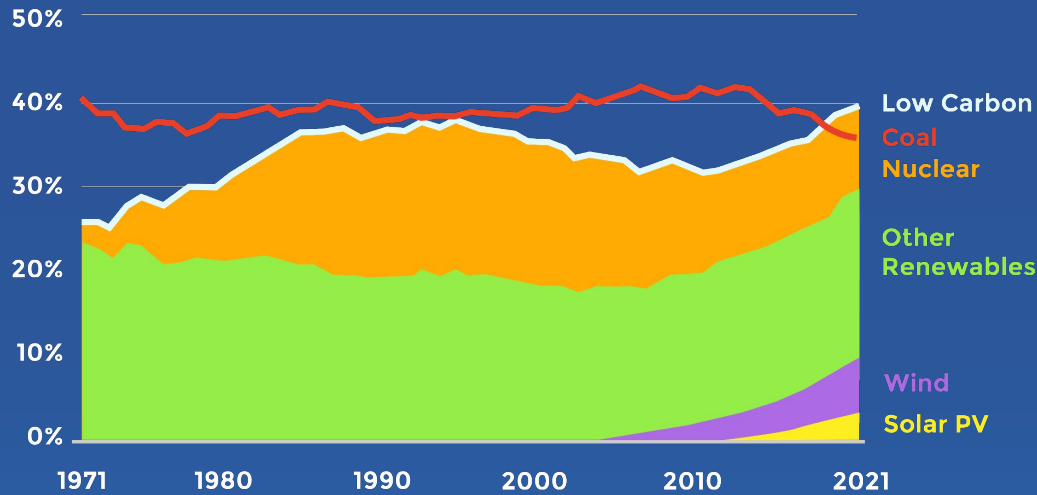


Indonesia energy transition readiness assessment 2021

Launching event of IETO 2022
21 December 2021

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Global renewable energy trend keeps increasing in the last 10 years

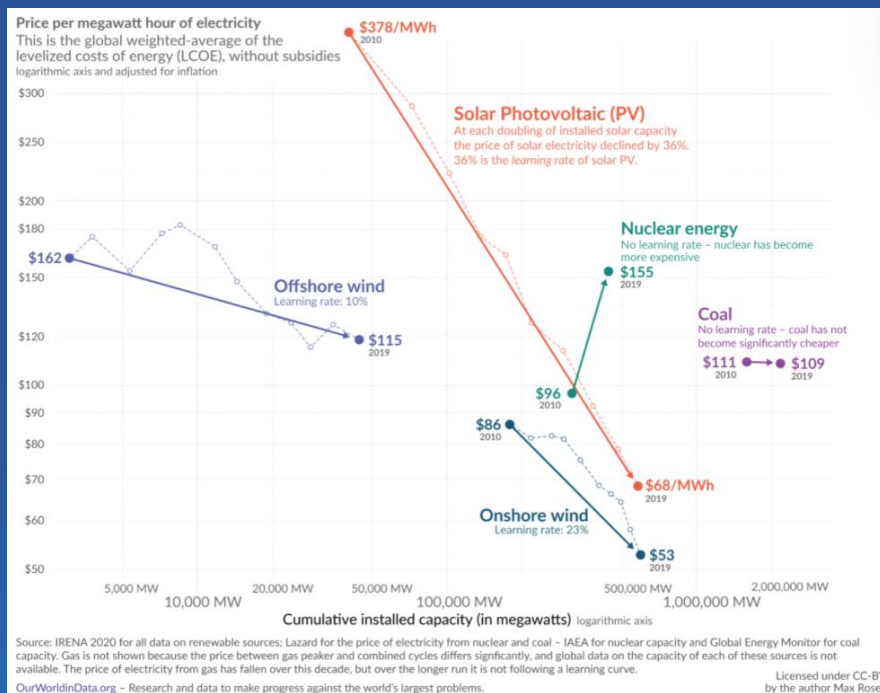


Source: IEA (2021)

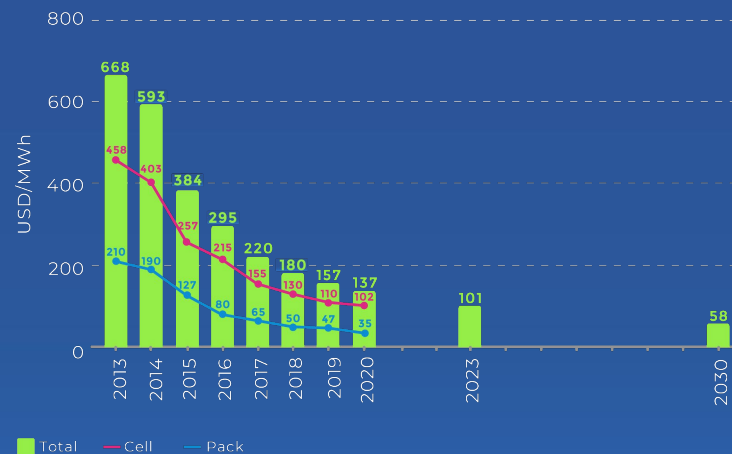
Current global electricity generation share trend:

- Renewable energy is projected to be 30% higher than last year, with solar PV and wind is 18% and 17% higher
- Coal utilization for power sector is predicted to keep decreasing for 4-4.5%
- Nuclear power will decrease around 2%

As renewables technologies and battery storage cost keep decreasing, Indonesia should be able to grab this opportunity



The average price of Li-ion battery cell and pack from all sectors



Source: BloombergNEF (2020)

Source: OurWorldinData (2021)

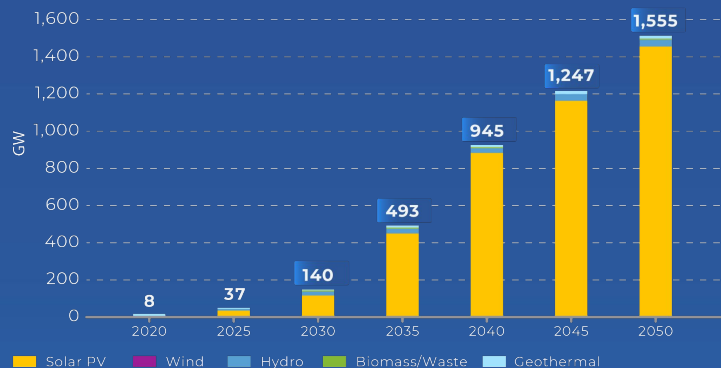
Indonesia actually has an abundance of renewable energy that is more than needed to decarbonize energy system in 2050

Type	Technical potential
Solar	7,714.6 GW
Mini-hydro	28.1 GW
Wind	106 GW at 50 m of turbine height
Biomass	30.7 GW
Pumped Hydro Energy Storage	7,308.8 GWh

Source: IESR (2021)

Indonesia has the potential and could seize the opportunity.

Decarbonization pathway: Renewables installed capacity



Source: IESR, Agora Energiewende & LUT University, 2021

Next question is:

Does Indonesia has well-structured enabling environment to welcome renewable energy?

Will Indonesia's power system and governance be ready to shift into renewables-based system?

Analyzing Indonesia's readiness in energy transition focusing on the power sector using a comprehensive framework

Political
and
regulatory

Invest-
ment and
finance

Techno-
economic

Social

Analysis approaches:

- Self-assessment
- Interviews
- Surveys to local banks, developers, and public

Political and regulatory

Key energy policies

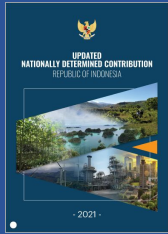
Regulatory framework quality

Financial support

Consistency with other regulations

Implementation

Indonesia's main energy policies have insufficient targets



Updated NDC has targets that is similar as the previous one: GHG emissions are lower by 29% (voluntarily) or 41% (with international support) than business-as-usual scenario by 2030. **If worldwide follows this target, global temperature rise will exceed 4°C by 2100**




LTS document has a net-zero emission target in 2060 or sooner, but **the share of CFPP is still 38% in the primary energy mix, in which 78% of them is equipped with CCS that may cause higher LCOE**

The main energy policies (KEN and RUEN) states the target of new and renewable energy share is 23% in 2025 and 31% in 2030. **With the current slow renewables growth, the share of NRE will be only 15% in 2025 and 23% in 2030 based on IESR's study.**

LOW

Key policies

Less public fund is allocated for clean energy



At least
\$6.54 billion
Supporting fossil fuel energy

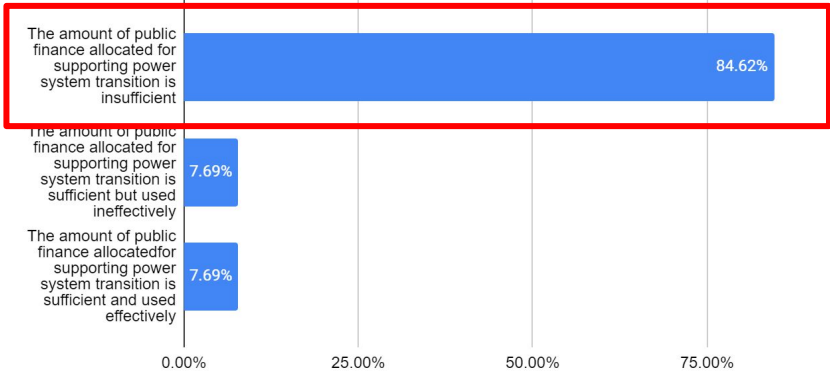
\$24.16
Per capita



At least
\$240.02 million
Supporting clean energy

\$0.89
Per capita

Do you think the government provides sufficient financial and fiscal support for power system transition/decarbonization?

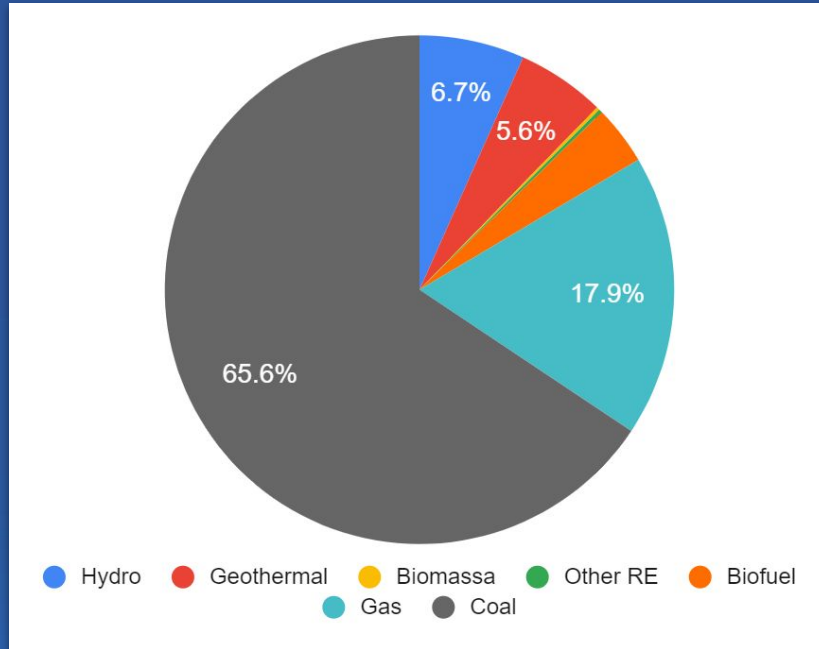


Source: IESR's survey to developers

Source: Energy Policy Tracker (2021)

LOW
Financial support

Power system is still dominated by coal until Q3 of 2021



Source: DGE Press Conference Oct 2021

Until September 2021, the shares are:

- Coal: 66%
- Renewables: 11%

Implementation **LOW**

Power system planning needs more stable regulations

Regulation stability criteria:

Transparency

Many stakeholders perceive that the policy-making process is oftentimes intransparent

Longevity

RUEN, RUED, and LTS valid for at least 30 years, but RUPTL, which is the base of power system planning, keeps changing in every 1-2 years

Consistency

Regulatory
framework quality

MEDIUM

A strict implementation of existing and new regulations are needed to support decarbonization in power sector

Air quality

Existing emission standards for CFPP are still lower compared to global best practices

Energy efficiency

Government is still synchronizing the revised draft of Government Regulation No. 70/2009 on energy conservation in the Inter-Ministry Discussion

Rural electrification

Rural electrification strategy in RUPTL should prioritize locally available energy sources or renewables for isolated areas where the distribution network could not reach

Green building

MEMR regulation 49/2018 stated that solar panel is allowed to be installed by PLN consumers, however there is no subsidies for the installers

RUED

22 provinces have RUED, but only several provinces state that they will use more than 20% of RE in the energy mix by 2025 or 2030

Consistency with other regulations

MEDIUM

Investment and finance

Invest-
ment risk

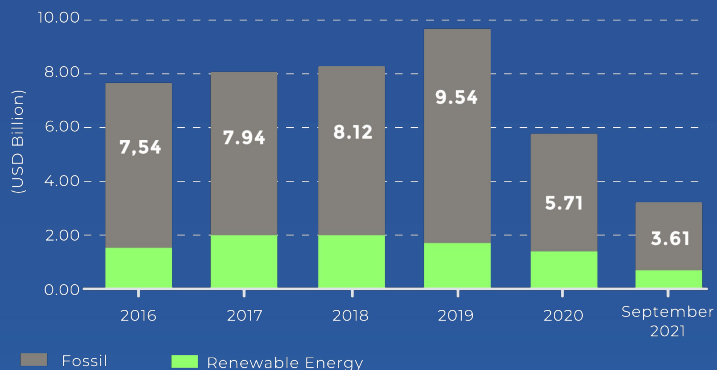
Access to
capital

Ease of
entry

Power
sector
invest-
ment
trend

Existing regulations become hassles to the renewables investment

Fossil and renewable energy generations realised investments



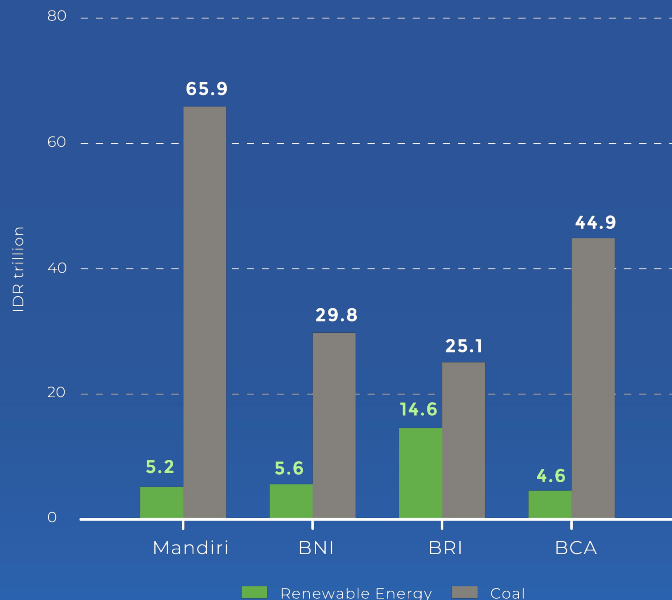
- Investment for renewables is still lower than for fossil fuel, which is affected by existing regulation causing:
 - Renewable energy are seen as unattractive sector due to the implementation of existing regulations, specifically MEMR regulation no. 50/2017 and the long-awaited renewable energy law
 - Time consuming process to get permit, affecting an increase in transaction process, and complex procurement mechanism are also mentioned as the challenges on financing RE projects by developers

RE in power sector investment trend

LOW

Risks in investing into the renewable energy projects and the difficulties to enter into Indonesia's market are also seen as other investment challenges

Investment in coal vs renewable energy (Q1 2021)



Source: IESR calculation

- Indonesia has investment risk rated as the medium grade risk and categorized as repressed due to the high investment and market entry barriers
- The amount of investment for renewables from local banks are still lower than for coal indicating the unfamiliarity for investing in renewables

Investment risk

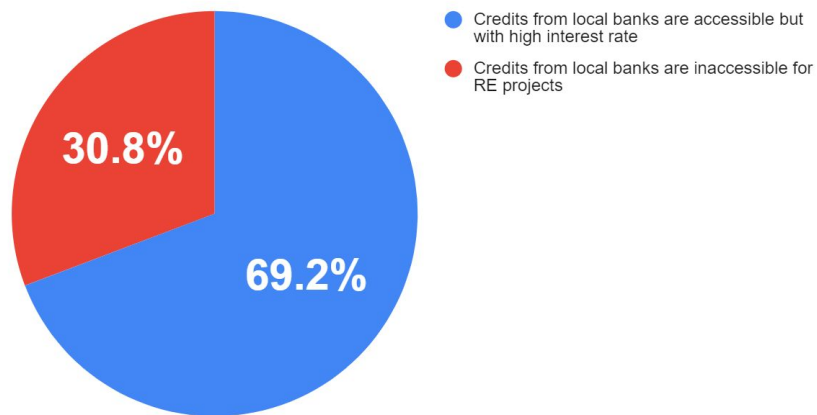
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Ease of entry

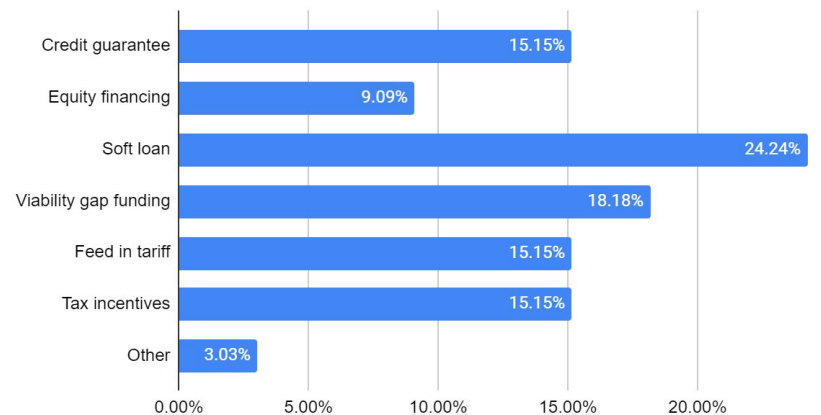
LOW

Renewables developers need more support for financing renewable energy projects

How do you view the access to credit from local banks for RE projects?



What kind of financial/fiscal support do you think needs to be increased to accelerate energy transition in power sector, if a...



Source: IESR's survey to developers

Access to capital

MEDIUM

Techno- economic

Power
system
planning

RE
economic

More regulations come to give more space to renewables in power sector

This year, we have:

- RUPTL 2021-2030 with 51.6% of planned capacity addition from renewables in 2030
- Latest grid code, launched December 2020, regulates clearly the application of high VREs penetration
- Announcement of coal moratorium after 2023 and coal retirement, specifically on retiring all CFPP aged over 30 years old from 2030 and early-retiring 9.2 GW of CFPP aged under 20 by 2030
- The first pilot program of Emission Trading System participated by 32 CFPPs with a total transaction of 42,455 tCO₂
- Government's statement on implementing carbon tax in April 2022 with the value of USD 2.1/tCO₂, which is still far below IPCC's proposed value of USD 40–80/tCO₂ by 2020 and USD 50–100/tCO₂ by 2030

Power system
planning

MEDIUM

Renewable energy becomes more competitive this year

- As global RE technologies cost keeps decreasing, RE generation cost in Indonesia is also decreasing. The recent lowest PV project bidding offered USD 0.04/kWh compared to the coal average generation cost for around USD 0.05-0.07/kWh
- RE developers also state that they actually have access to the least cost technologies, but most of them are imported goods since the locally-made technologies are still lacking on the quantity and quality

MEDIUM

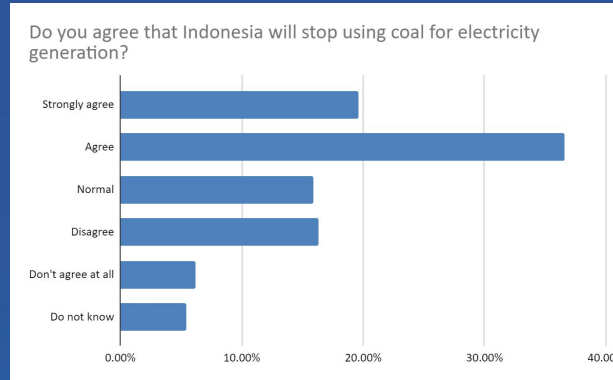
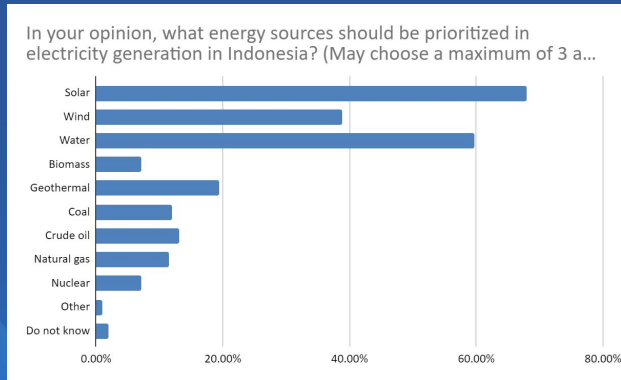
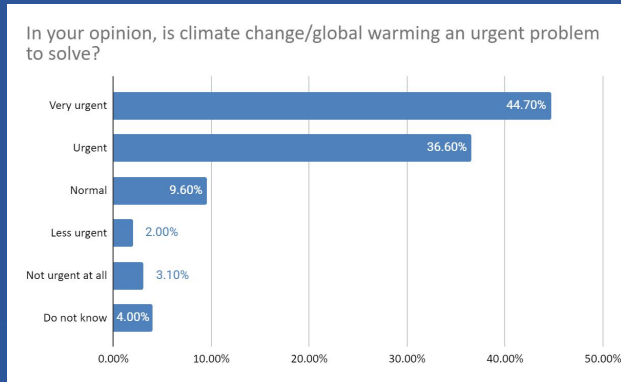
RE project economic

Social

Public
aware-
ness and
accept-
ance

Human
capital

Public gives the full support on energy transition



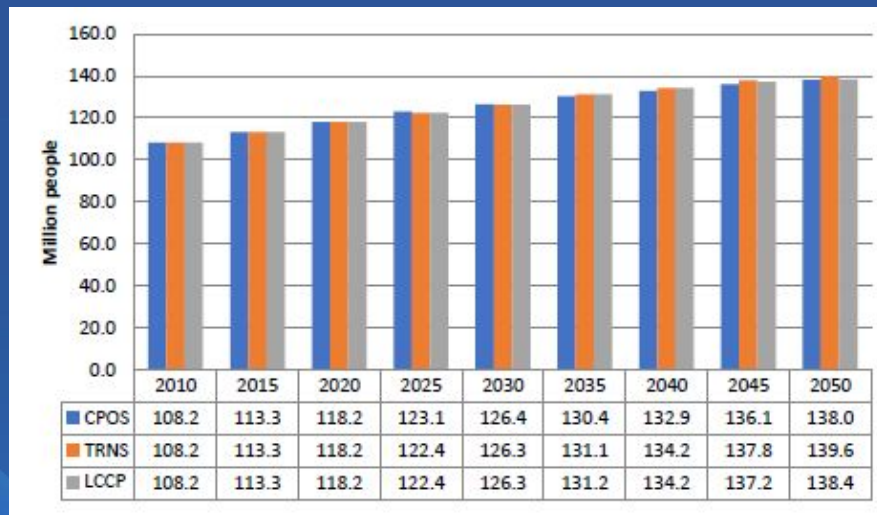
Source: IESR's survey to public

Public awareness
and acceptance

HIGH

There is still lack of government's strategy on preparing human resources

Employment needed for green jobs predicted using current policies (CPOS), transition condition (TRNS), and low carbon policies (LCCP)



Source: LTS-LCCR document

Government states the needs of human resources in green jobs, but there isn't any clear strategy on preparing the workforce for the transition.

MEDIUM

Human capital

There is an improvement of renewable energy environment this year, but it is not enough

Dimension	Political and Regulatory					Techno-Economic	
Variable	Political Will & Commitment			Regulatory Framework Quality		Power System Planning	Economic of Energy Transition
Indicator	Climate and energy policy alignment with Paris Agreement	Public finance allocation	Implementation of policy targets	The regulatory framework stability and attractiveness	Regulatory consistency between government bodies	Power system planning suitability with high RE	Cost competitiveness of renewable technology
Rating in 2021	Low	Low	Low	Medium	Medium	Medium	Medium
Rating in 2020	Low	Low	Low	Low	Low	Low	Low
Dimension	Investment and Finance				Social		
Variable	Investment Climate for Renewable Energy Power Plant			Power Sector Investment Trend	Public awareness & acceptance	Human capital	
Indicator	Investment risk	Ease of entry	Access to capital	Trend and sufficiency of investment	Public awareness and support for renewables and coal phase-out	Integration of energy transition and employment policy	
Rating in 2021	Medium	Low	Medium	Low	High	Medium	
Rating in 2020	Medium	Low	Medium	Low	N/A	Low	

Overall assessment conclusion



Thank you

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