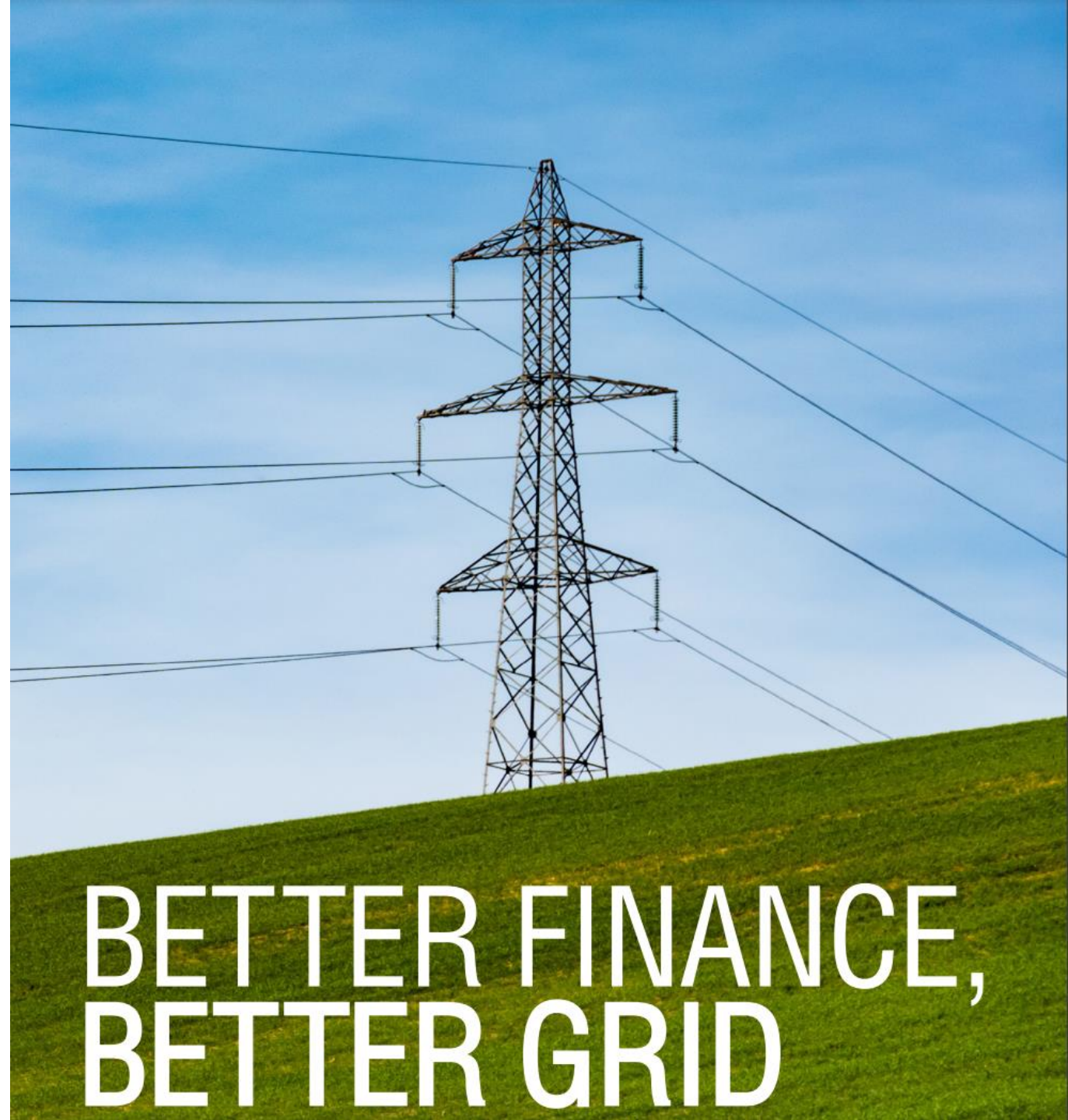

BETTER FINANCE, BETTER GRID

Mobilising capital to scale transmission grid capacity in South Africa to improve energy security, create jobs and support inclusive growth



BETTER FINANCE, BETTER GRID

Unlocking catalytic capital to strengthen the transmission grid is critical and urgent for a more secure and equitable power system

1. **Mobilising capital to scale transmission infrastructure is essential to improve energy security, create jobs and support inclusive growth**
 - Installed generation capacity needs to almost double in 2032 compared to 2022, adding ~5GW per annum for at least the next 20 years
 - Renewable generation (wind & solar) is the fastest and cheapest way to provide most of the required capacity increase, increase in build & connect rate needed from ~1.5GW per year to 4-5 GW per year
 - Without coordinated action there may be no transmission grid capacity in the near future for >60% of new generation capacity needed
2. **A national strategic program of investment, that builds on South Africa's unprecedented leadership to finance a just energy transition, can help overcome existing barriers**
 - It currently takes 7-10 years to develop new transmission infrastructure, compared to 3-4 years for renewable generation projects
 - In the short term, transmission grid connection capacity can only be created through optimising use of the existing transmission infrastructure, with potential to unlock 17 GW of transmission capacity
 - Simultaneously, the national program needs to achieve an 8 times faster build rate (from 300 to 2,300 km per year) by overcoming key barriers around access to capital, planning & permitting, procurement and qualified workforce availability to ensure sufficient grid capacity going forward
3. **Off-balance sheet project finance structures can help secure the required access to capital**
 - Investments of 235 – 373 bn ZAR are likely required in the next 10-12 years for transmission infrastructure.
 - Case studies from around the world show that capital can be successfully mobilised for transmission infrastructure investments using different models with different degrees of ownership and control
 - Independent Transmission Projects (ITPs) are likely to be the most successful model to finance transmission grid infrastructure in the short term. They have a proven track record in other emerging economies and can be implemented on specific projects, tailored to the desired ownership and control of the transmission company
4. **An efficient and catalytic allocation of public capital could help accelerate the build out of the transmission infrastructure by lowering the cost of capital**
 - This could include concessional loans or development guarantees to ITPs which help mitigate certain timing and investment risks
 - International climate finance like the \$8.5 billion pledged by rich countries for South Africa's Just Energy Transition under the "JET-P" could be one source of this catalytic funding, deployed through development banks like the DBSA and the AfDB.

Unlocking catalytic capital to strengthen the transmission grid is critical and urgent for a more secure and equitable power system

1

Mobilising capital to scale transmission infrastructure is essential to improve energy security, create jobs and support inclusive growth



2

A national strategic program of investment, that builds on South Africa's unprecedented leadership to finance a just energy transition, can help overcome existing barriers



3

Off-balance sheet project finance structures can help secure the required access to capital



4

An efficient and catalytic allocation of public capital could help accelerate the build out of the transmission infrastructure by lowering the cost of capital

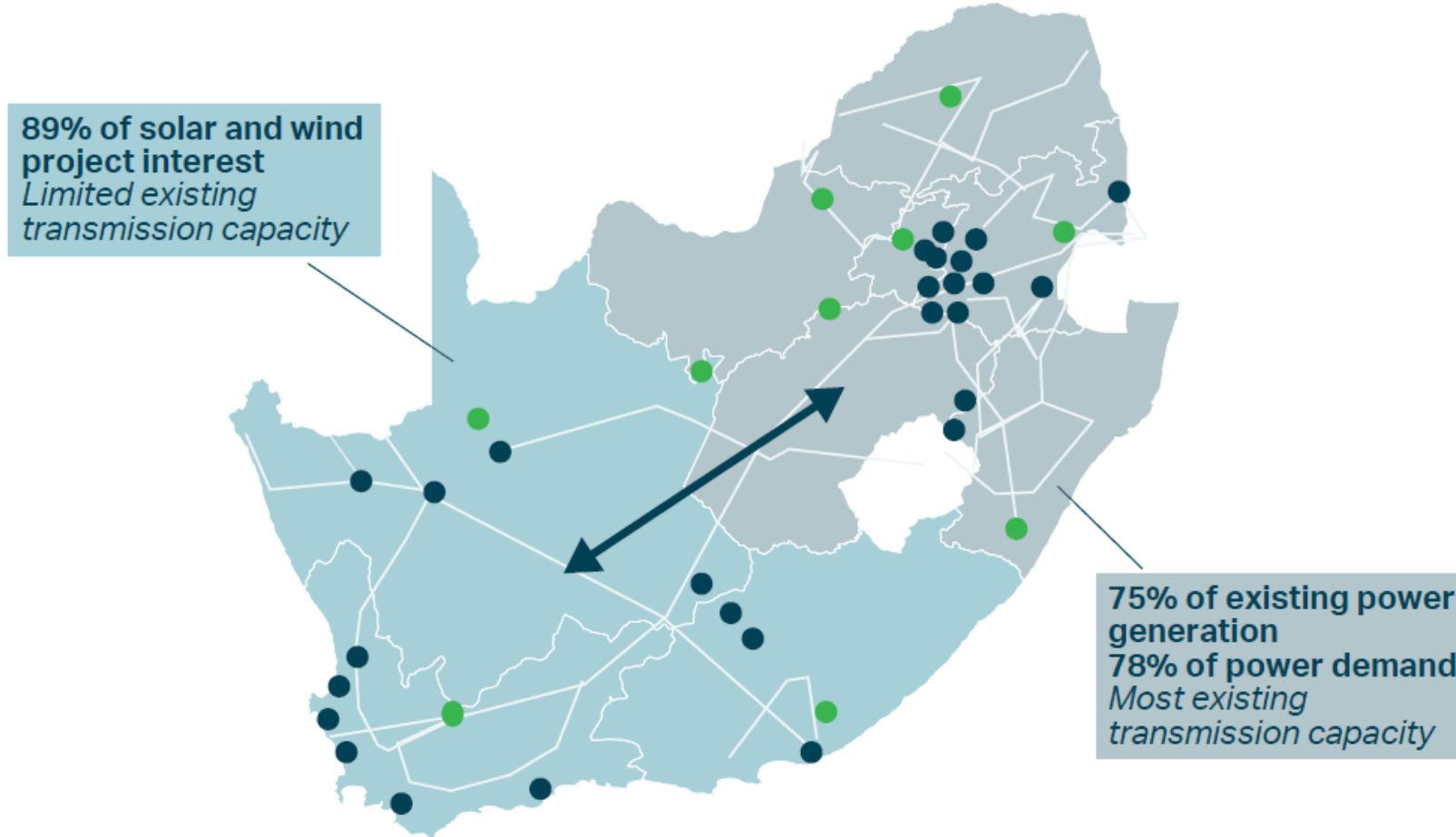


1

**Mobilising capital to
scale transmission
infrastructure is
essential to improve
energy security, create
jobs and support
inclusive growth**



While best renewable resources are in the south west, most transmission infrastructure is in the north east



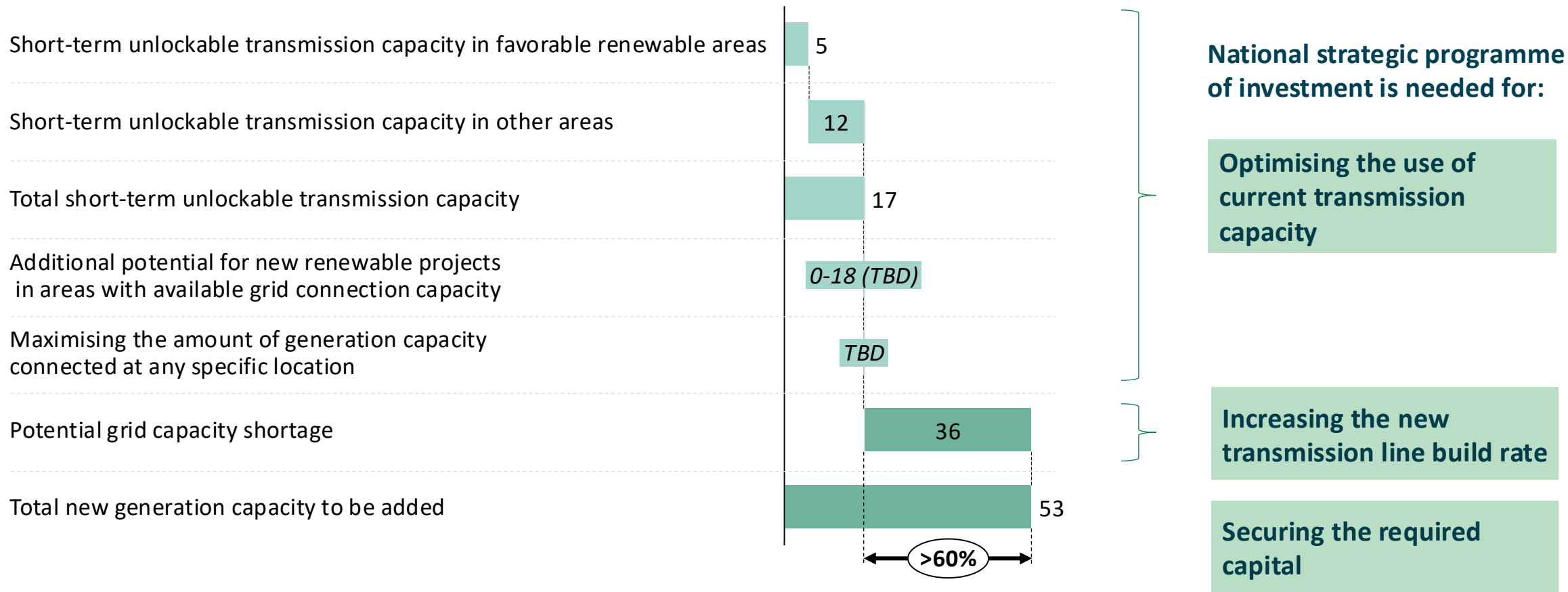
- **Renewable generation is the fastest and cheapest** way to build new generation capacity – even in less favourable locations its cost are still significantly lower than new coal
- Based on the TDP, **4-5 GW per year of renewable capacity** needs to be built and connected
- **Best resources for renewable generation are in the south west** of the country – but transmission infrastructure is limited

Without coordinated action there may be no grid capacity for >60% of new generation capacity

Grid capacity shortage towards early 2030s

GW

Capacity
Minimal requirement



2

A national strategic program of investment, that builds on South Africa's unprecedented leadership to finance a just energy transition, can help overcome existing barriers



It currently takes 7-10 years to develop new transmission infrastructure, compared to 3-4 years for generation

Typical development timelines



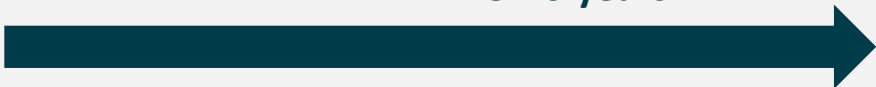
RENEWABLE ENERGY DEVELOPMENT

3-5 years



DEVELOPMENT OF TRANSMISSION GRID

5-10 years



New build-out of the transmission grid has longer development timelines than renewable energy development

- Grid project development timeframes in order of 7-10 years, whereas for renewables this is equal to 3-5 years
- A key factor in these timelines is acquiring right of way for all the land that is crossed by transmission lines
- Speeding up requires tackling planning & permitting processes (long timelines), workforce availability, and procurement procedures

In the short term, capacity can only be unlocked through optimising use of the existing transmission infrastructure

Actions

A

Focus new renewable generation projects in areas with available grid connection capacity

- A1** Limit near term renewable development to areas with transmission capacity
- A2** Build renewables projects at/near sites of decommissioned coal plants
- A3** Accelerate uptake of rooftop solar

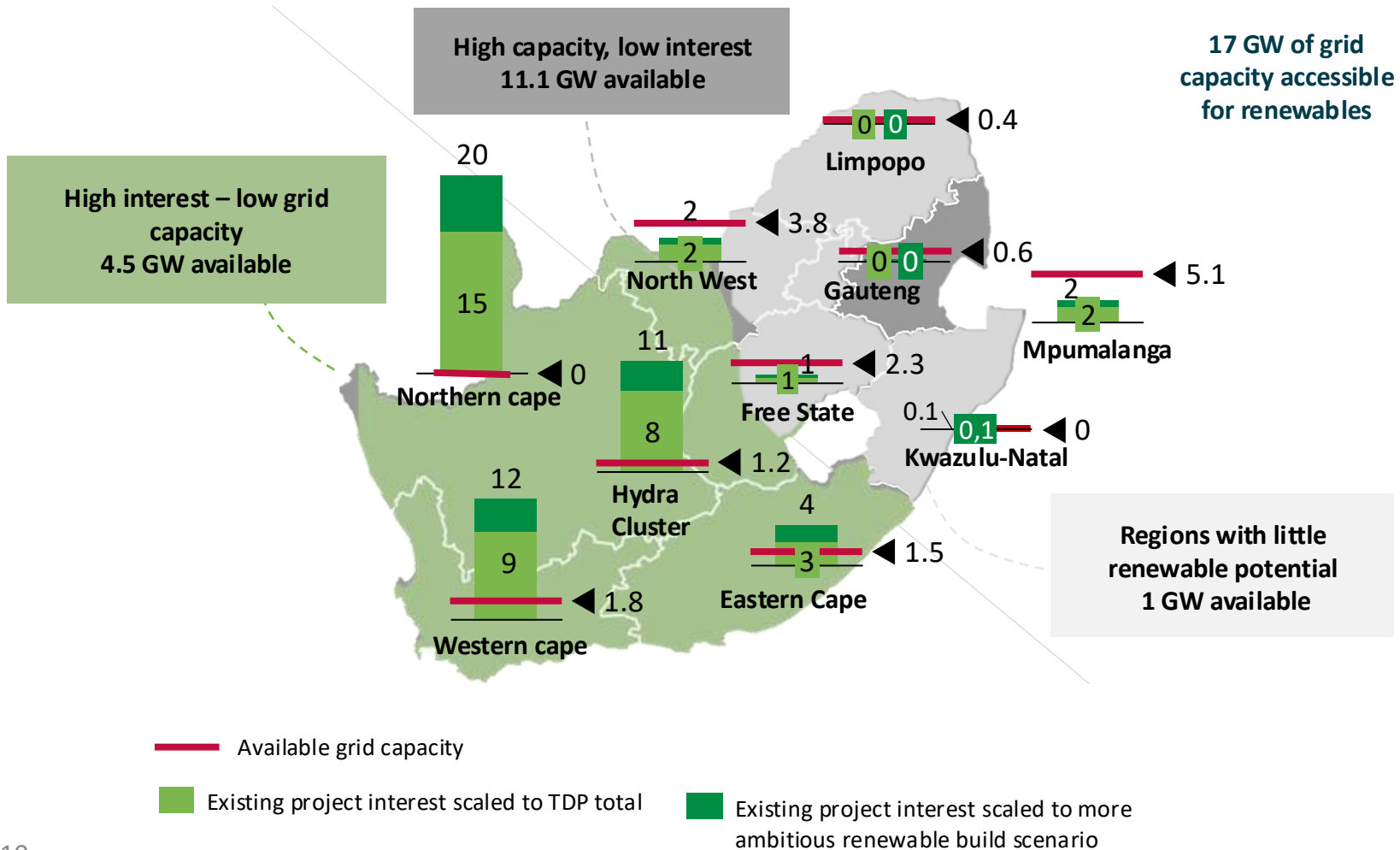
B

Maximise the amount of generation capacity connected at any specific location

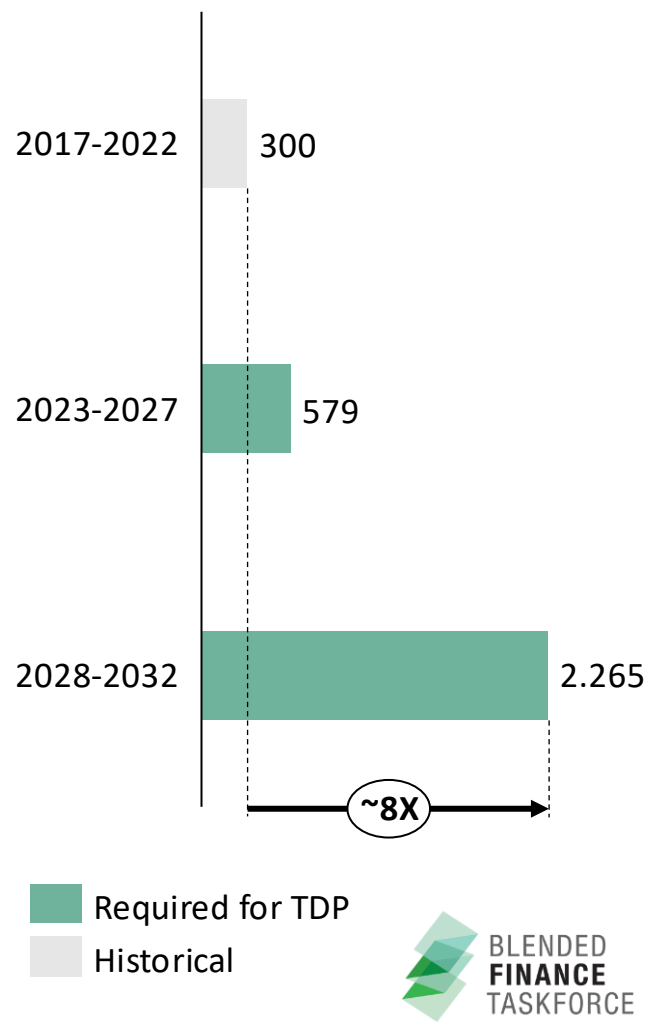
- B1** Co-locate solar and wind
- B2** Oversize capacity of solar and wind
- B3** Use batteries to shift renewable generation in time
- B4** Include voluntary curtailment

National program needs to achieve an 8 times faster build rate

Wind and solar project interest versus available grid capacity
GW



Average yearly rate of transmission line build-out (TDP)
km



Deep-dive: key barriers to overcome to achieve required build rates

Barriers to overcome	Explanation	Way forward
Access to sufficient financing	▪ Eskom faces debt-burden of 392 bn ZAR of debt and difficulty to attract capital ▪ Transmission unbundling in separate Transmission Company meant to free more investment capacity in transmission grid – but constraints likely remain	▪ Explore options for transmission financing outside off transmission authority balance sheet
Planning & permission hurdles	▪ Timelines for development of transmission lines primarily dictated by timelines of (environmental) permits and obtaining right of way ▪ Timelines from design to completion need to be reduced from current minimum of 7-10 years	▪ Assign the transmission build out a Strategic Investment Project (SIP) status ▪ Use prioritised zones where development of lines is accelerated
Procurement of materials	▪ Increasing the speed of transmission line build-out requires a significant scale up in the procurement capacity ▪ The low transmission build rate in recent years and national procurement laws that require local sourcing limit ability to quickly scale purchasing of essential products	▪ Allow Eskom and/or the NTCSA to draft its own procurement policy allowing for fair, equitable, transparent, competitive and cost-effective ▪ Allow for long-term procurement contracts to order materials and products in advance
Qualified workforce availability	▪ South African contractors that can execute transmission line build programs are currently not set-up for the scale and speed of the build out program	▪ Create a more predictable environment that gives contractors incentives to invest ▪ Invest in workforce training programs to ensure sufficient qualified, local employees

3

Off-balance sheet
project finance
structures can help
secure the required
access to capital



Investments of 235 – 373 bn ZAR are likely required in the next 10-12 years for transmission infrastructure

Overhead lines and transformer capacity required to facilitate + 53 GW of capacity by 2032 – Eskom TDP

Just Energy Transition Investment Plan – Infrastructure investment requirements electricity sector

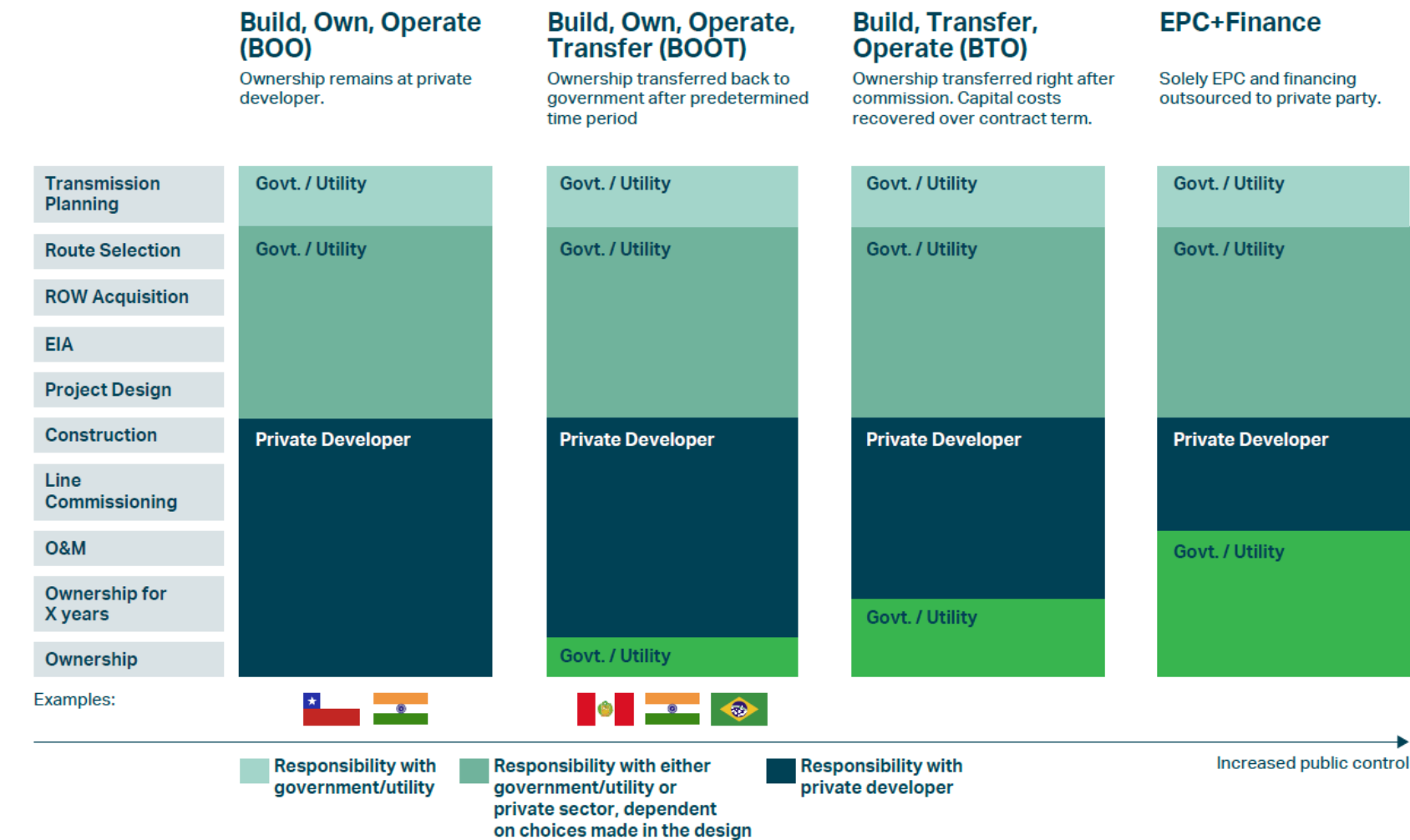
			
	TRANSFORMER CAPACITY	KM OF OVERHEAD LINES	COST ESTIMATE
2023-2027	27 GVA	2,893 km	48 bn ZAR
2028-2032^(a)	79 GVA	11,325 km	~187 bn ZAR
Total	106 GVA	14,218 km	~235 bn ZAR

(a) Estimated based on scaling 2023-2027 figures from Eskom

ZAR billions	2023-2027	2023-2035	Notes on who would invest
Coal plant decommissioning	4.1	19.3	Eskom – These Eskom estimates are based on the cost of decommissioning of plants set to retire over these time frames, and are additional to the investment costs of repowering and repurposing projects contained in Eskom's project pipeline.
Transmission	131.8	373.2	Eskom-owned and operated.
Distribution	13.8	127.5	This investment requirement covers both Eskom and Municipal distribution systems, but EXCLUDES the current maintenance backlog in Municipal distributors. (see Section 4.6).
New Solar photovoltaic (PV)	233.2	418.5	This includes utility scale PV AND distributed PV. Most investment is expected to come from the private sector, with some investment from Eskom in its repowering and repurposing programme.
New Wind	241.7	874.3	Apart from an extension of Eskom's Sere Windfarm and additions through its JET repowering and repurposing programme, this will be built and operated by the private sector.
New Batteries	23.1	44.2	Eskom has just awarded a contract to deliver phase 1 of a battery storage project. Other battery capacity may be built by Eskom or the private sector.
TOTAL	647.7	1 857	

Independent transmission Projects (ITPs) likely most successful to finance transmission grid infrastructure in the short term

Various ITP models are possible: government/utility can pick desired control and ownership level



Amount of Independent Transmission Projects auctioned



Brazil

70,000 km



Peru

6,000 km



India

21,000 km



Chile

>1,200 km

Potential for significant cost reductions – for example Peru: 36% cost reduction

4

An efficient and catalytic allocation of public capital could help accelerate the build out of the transmission infrastructure by lowering the cost of capital



An efficient and catalytic allocation of public capital could help accelerate the build out



Transmission infrastructure projects face several important risks for investors

Long-term investments with high capital expenditure like transmission infrastructure face significant risks, including:

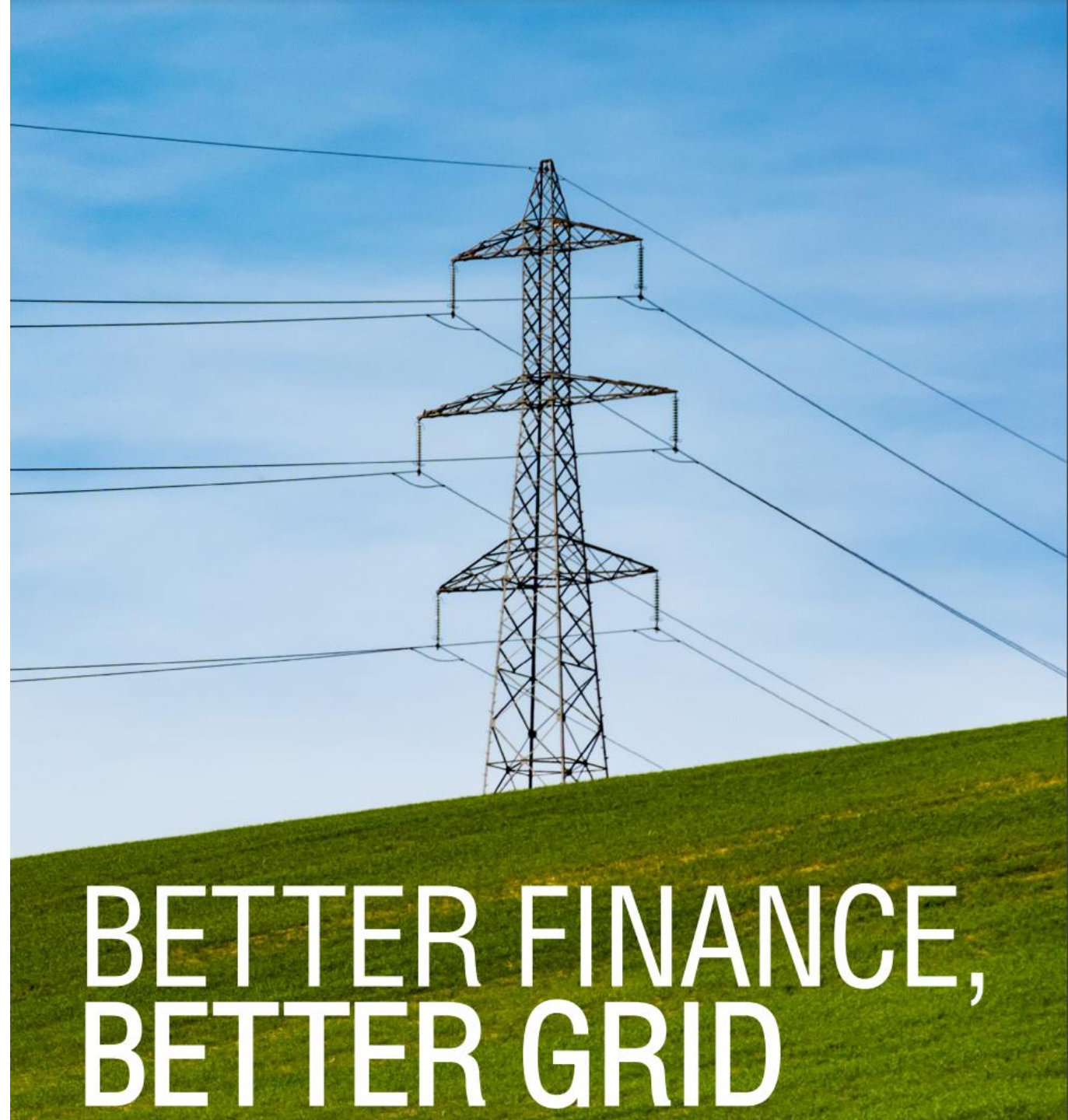
- **Acquiring right of way** for building transmission lines on the intended routes
- **Revenue risks** related to reliability of revenue streams for use of the infrastructure
- **Currency risks** for foreign investors related to changes in exchange rates



Catalytic use of public money could accelerate the build out

- **Lowering the cost of capital** through catalytic use of public money can unlock capital for transmission infrastructure
- **Catalytic instruments** may include
 - Concessional loans with lower interest rates
 - Development guarantees that help reduce project risks

QUESTIONS?



BETTER FINANCE, BETTER GRID