Title

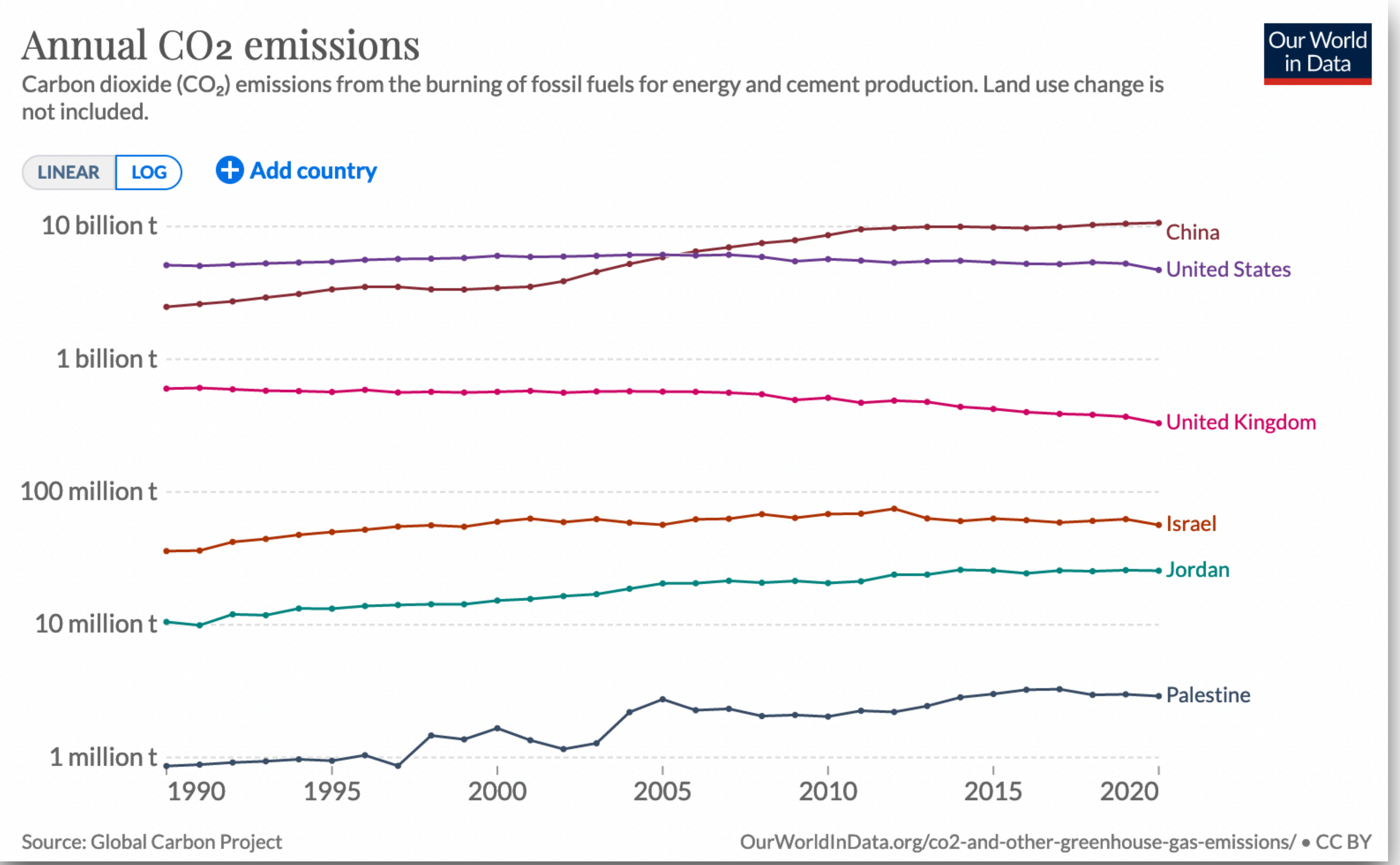
Subtitle

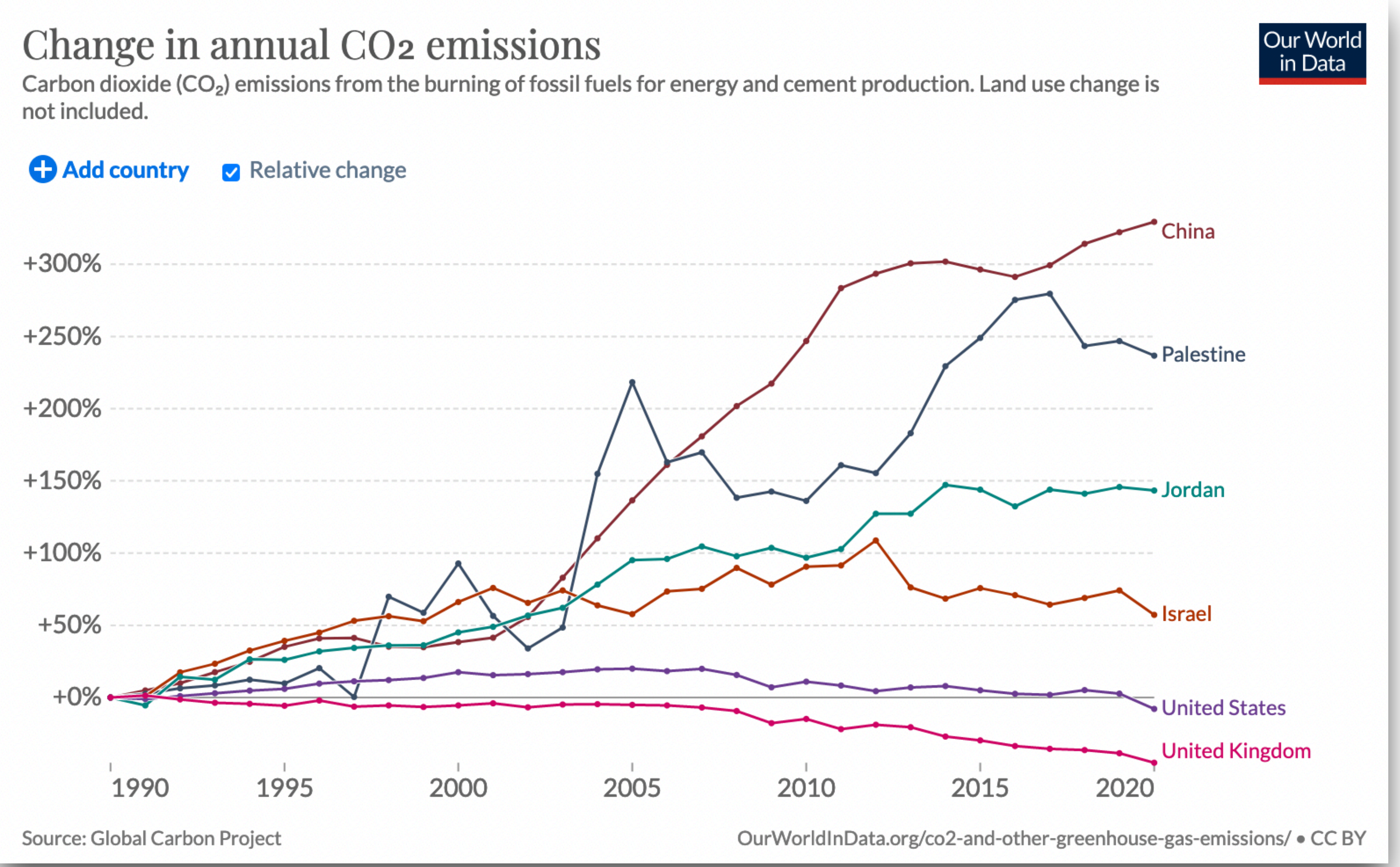
Authors, Date, Logos

Background

Background

Historical emissions





Background

Climate commitments

- Israel to phase-out coal by 2026
- Israel to increase renewable shares to 25% and 30% in 2025 and 2030
- Jordan targets 50% renewables by 2030
- Palestine to convert Gaza diesel plant to gas
- No specific renewables targets for Palestine

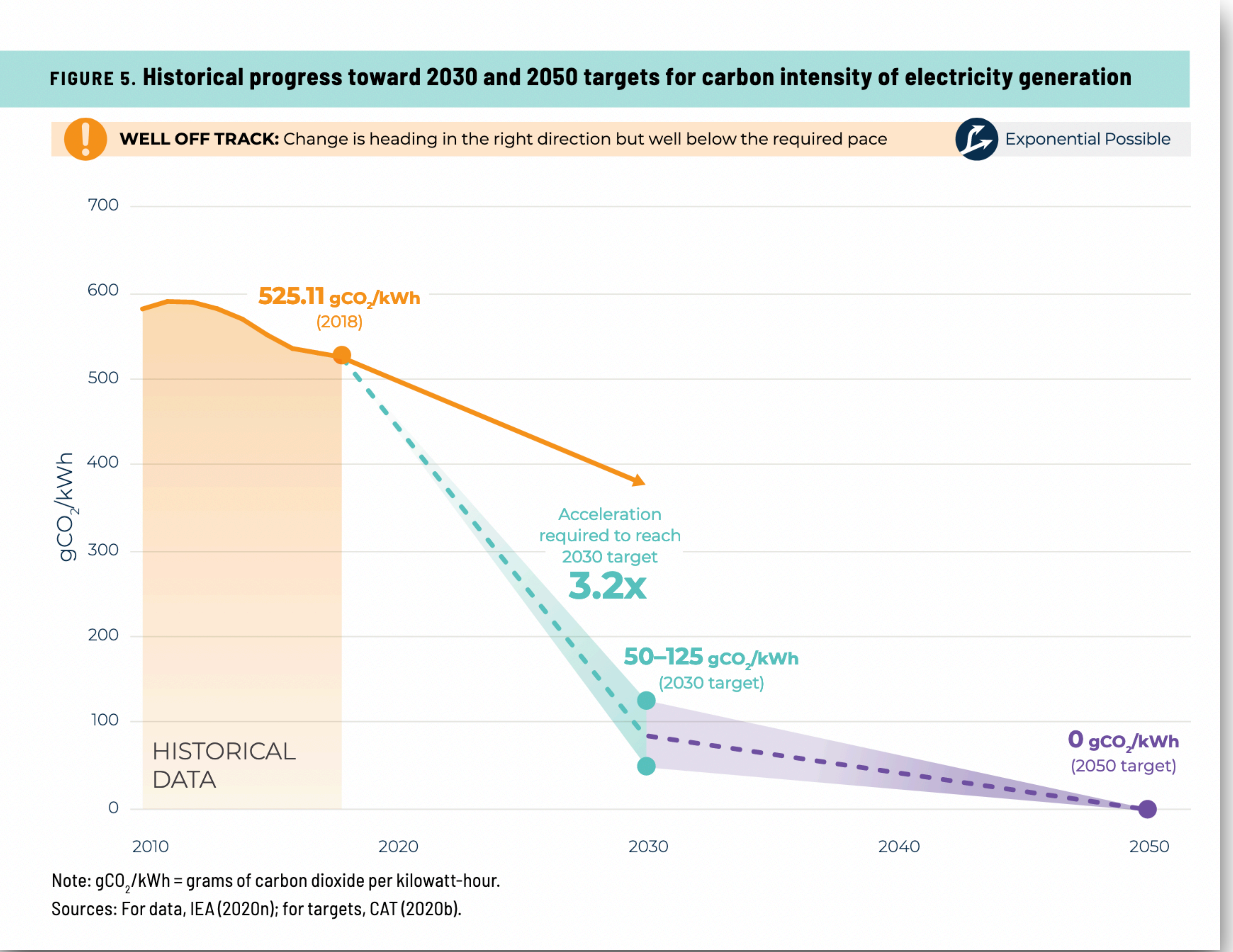
NDCs: GHG reductions	Israel	Jordan	Palestine
2030	27%	31%	-
2040	-	-	26.6% or 17.5%
2050	85%	-	-

Renewable targets	Israel	Jordan	Palestine
Today	7%	20%	?
2030	30%	50%	-

Speed and scale

Could level of ambition to decarbonise be increased?

- The global power sector is not aligned with the Paris agreement
- Numerous institutions (e.g., IPCC, IEA, CAT) calling for rapid and massive scale-up of renewables to 2030
- Investing in fossil assets risks carbon lock-ins and stranded assets
- Could cooperative energy policy could unlock deep decarbonisation in the region?



The regional energy landscape

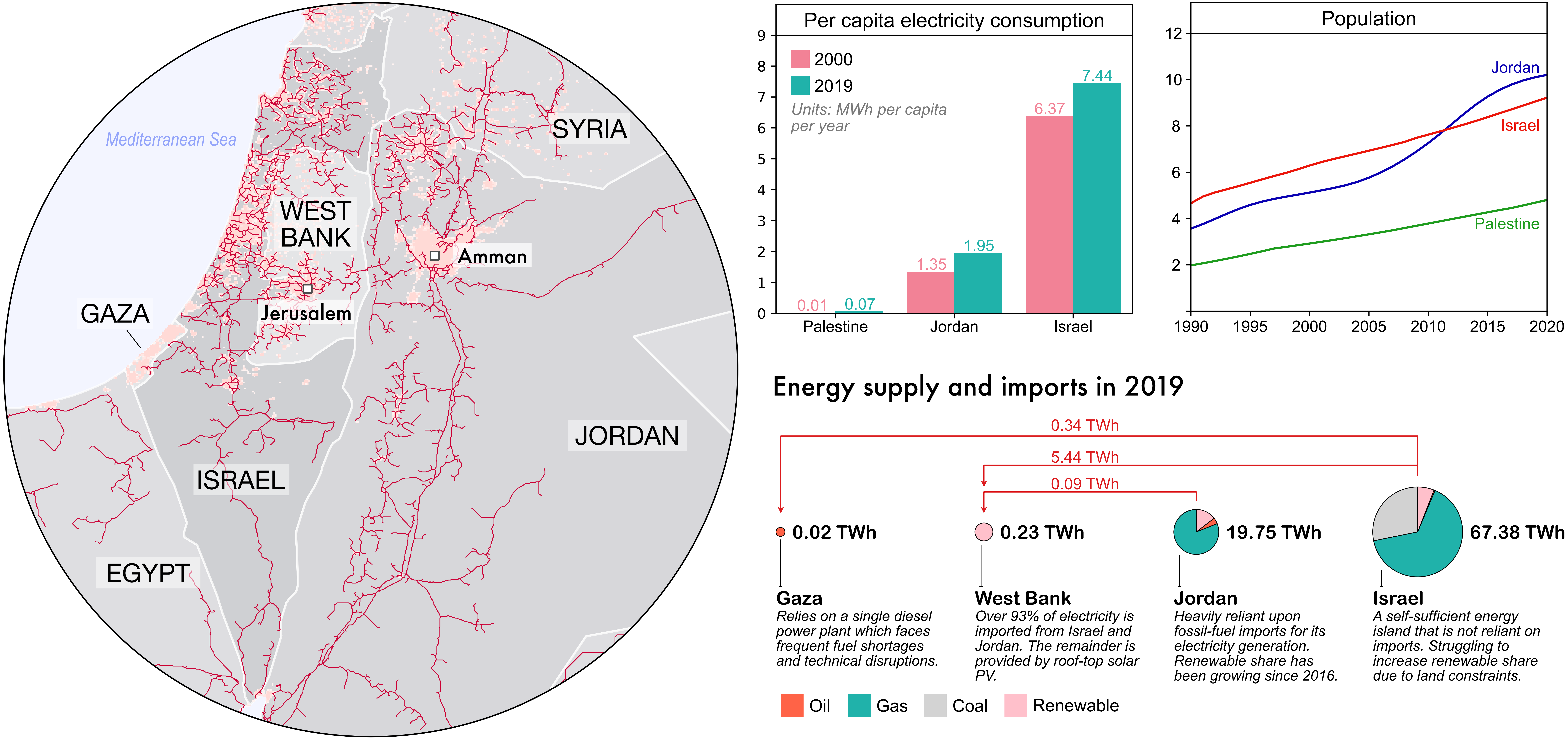
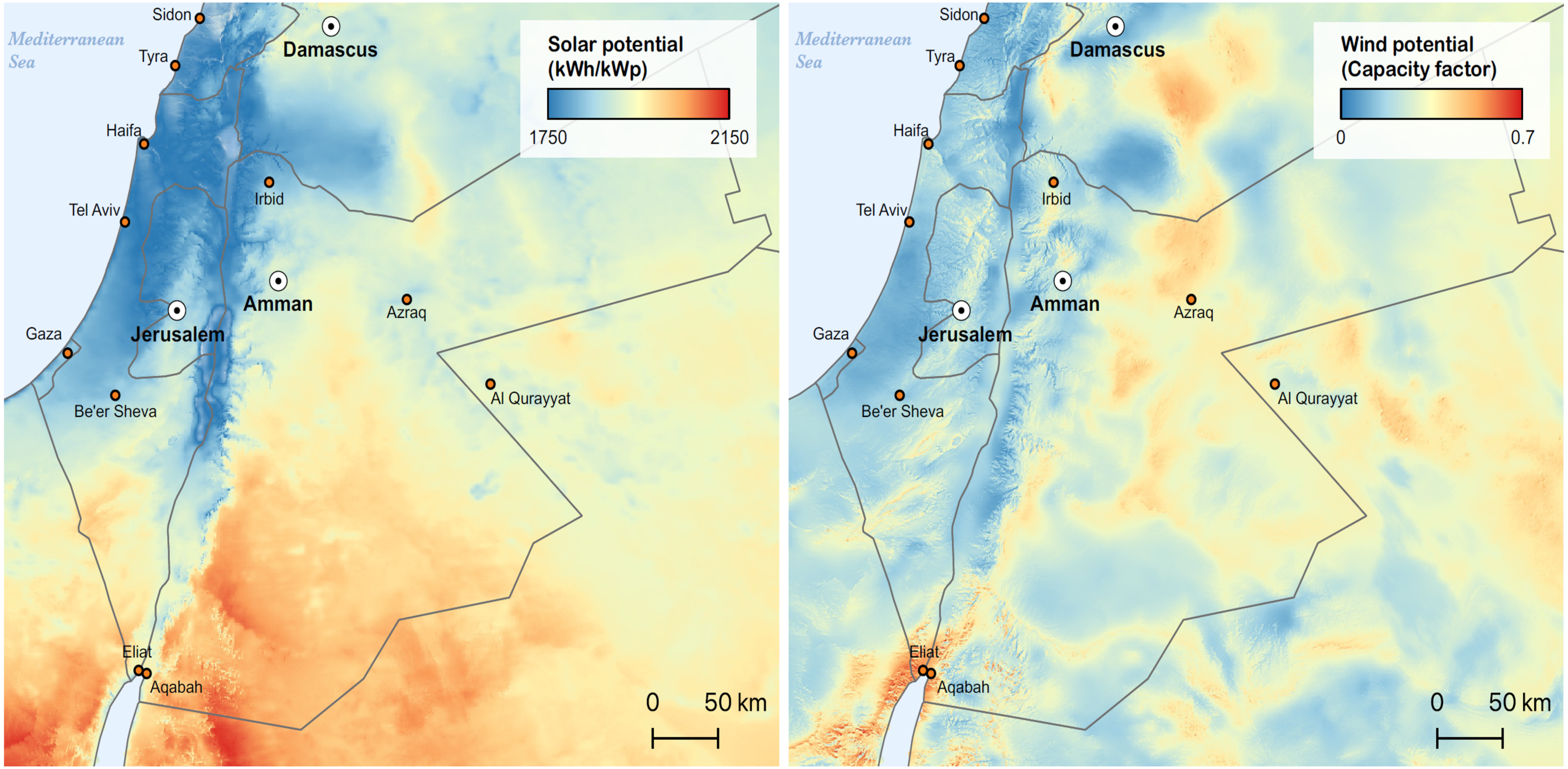


Figure: Infographic describing the current electricity system in Israel, Palestine, and Jordan.

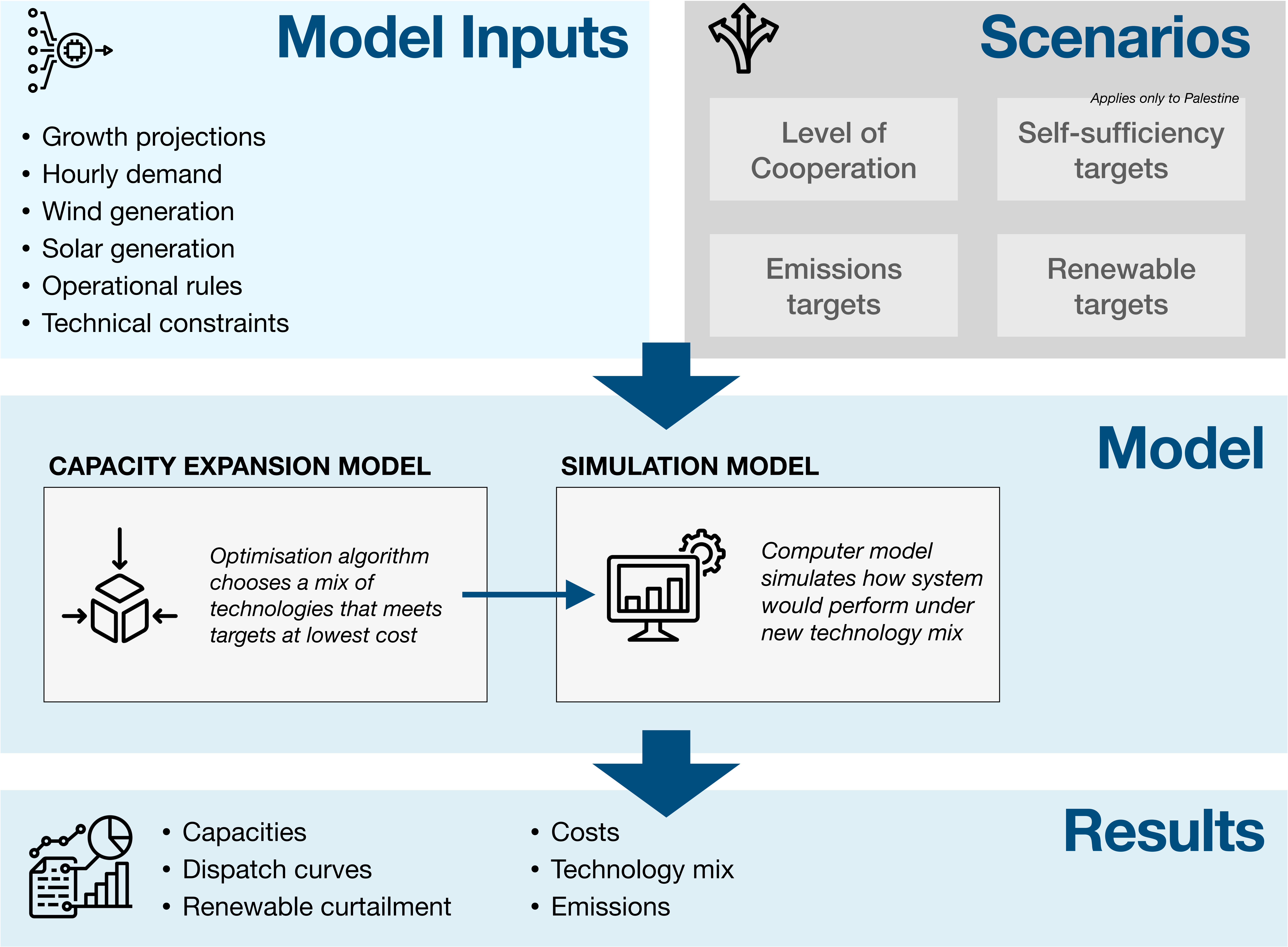
Background

- Rapidly reducing costs of renewable energy supplies: photovoltaic panels (PV), wind, battery storage
- Carbon emissions reduction commitments
- Unequal availability of solar radiation, wind intensity and land across the region -
- Varying patterns of time-of-day energy use across the region – due to differences in energy intensity and AC availability.
- Increasing demand for energy for desalination and air conditions… and to provide reliable energy supplies to Palestinians
- Consideration of transboundary energy transfers (the Prosperity Green project)

Solar and wind potential



Methods


Model Inputs
Growth projections
Hourly demand
Wind generation
Solar generation
Operational rules
Technical constraints
Scenarios
Level of Cooperation
Applies only to Palestine
Self-sufficiency targets
Emissions targets
Renewable targets
Model
CAPACITY EXPANSION MODEL
Optimisation algorithm chooses a mix of technologies that meets targets at lowest cost
SIMULATION MODEL
Computer model simulates how system would perform under new technology mix
Results
Capacities
Dispatch curves
Renewable curtailment
Costs
Technology mix
Emissions

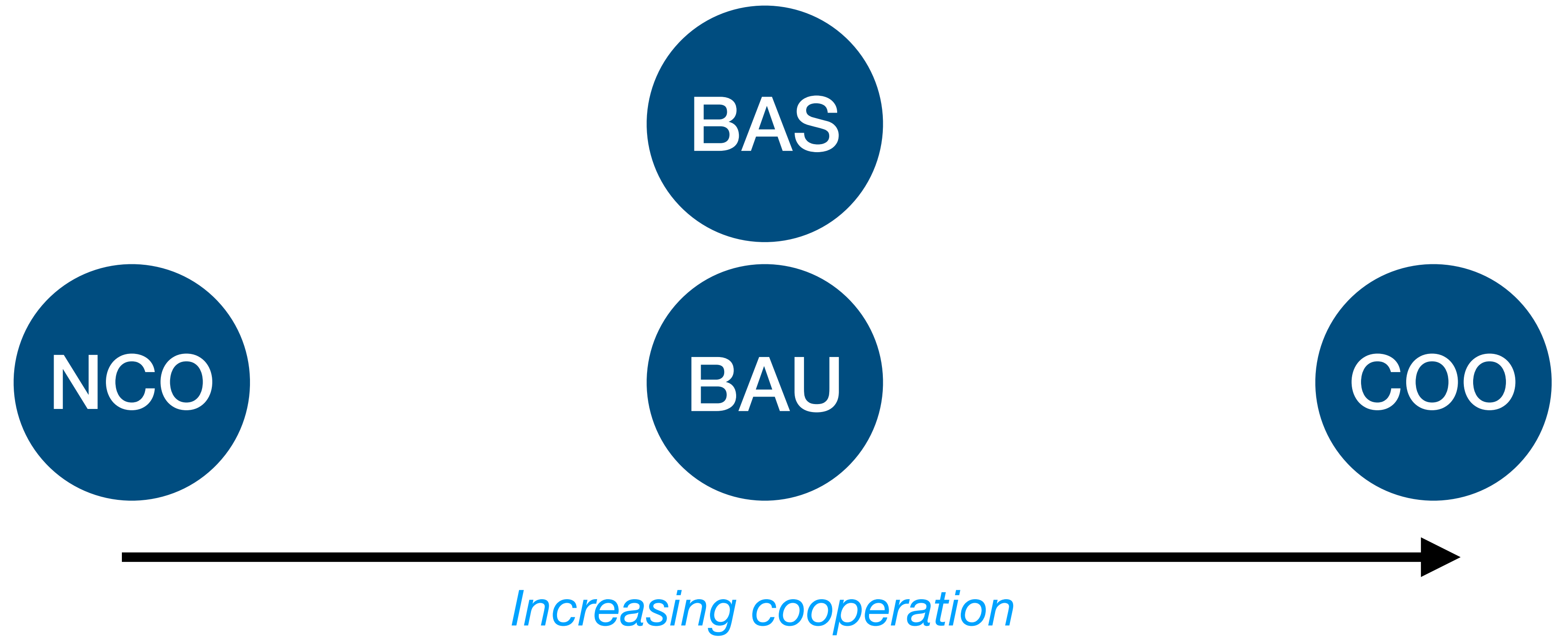
Scenarios

- **Baseline (BAS):**
  - No consideration of sustainable development goals;
  - Continue with business-as-usual practices;
  - Quantifies minimum infrastructure needed without sustainable transitions

- **Business-as-usual (BAU):**
  - Continue with current practices;
  - Develop sustainably: observing renewable/carbon targets;
  - Palestine aims for minimum level of self-sufficiency (30%)

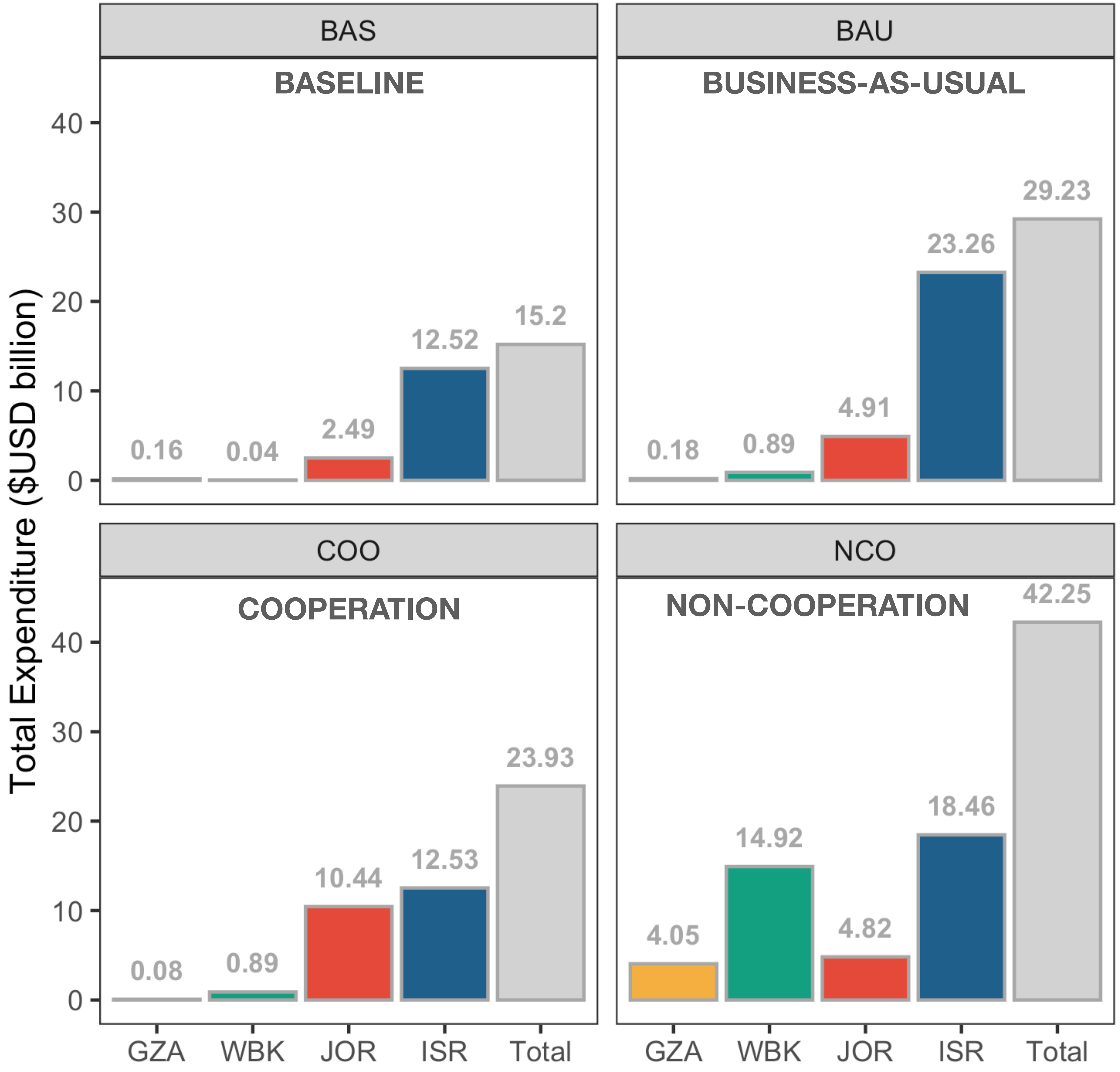
- **Non-cooperation (NCO):**
  - Develop sustainably: observing renewable/carbon targets;
  - Zero cooperation between regions;
  - Each region acts as an energy island

- **Cooperation (COO):**
  - Develop sustainably: observing renewable/carbon targets;
  - Complete cooperation between regions (i.e., unlimited energy trading);
  - Palestine aims for minimum level of self-sufficiency (30%)



Results

Costs



18%

Reduction in costs relative to current plan (BAU)

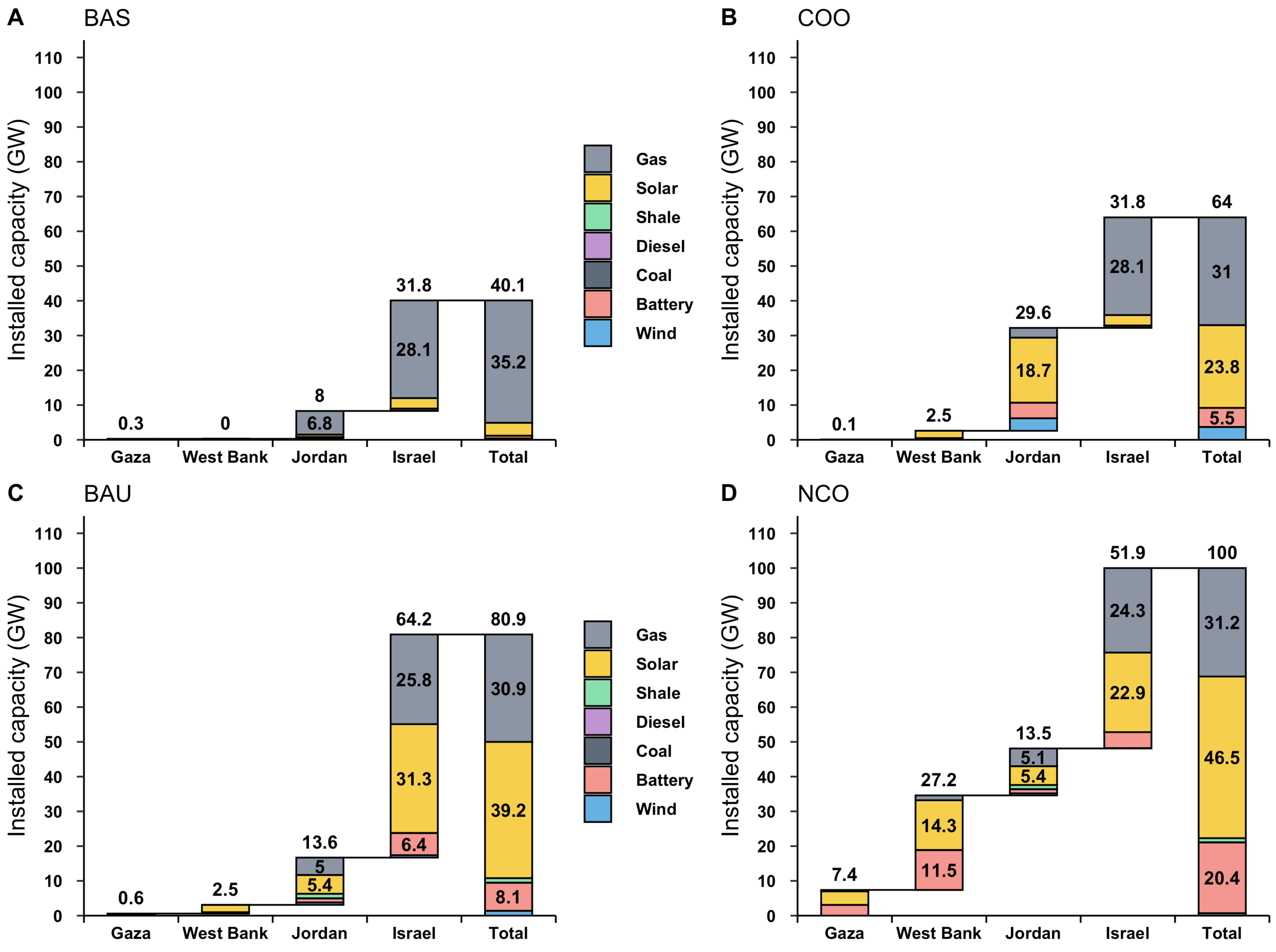
x2

Cost increase for Jordan relative to current plan (BAU)

127%

Cost of achieving total self-sufficiency in Palestine as a percentage of GDP

Capacities



38%

Reduction in build-out of solar and battery storage compared to current plan (BAU)

x2.1

Total capacity needed in Jordan compared to current plan

127%

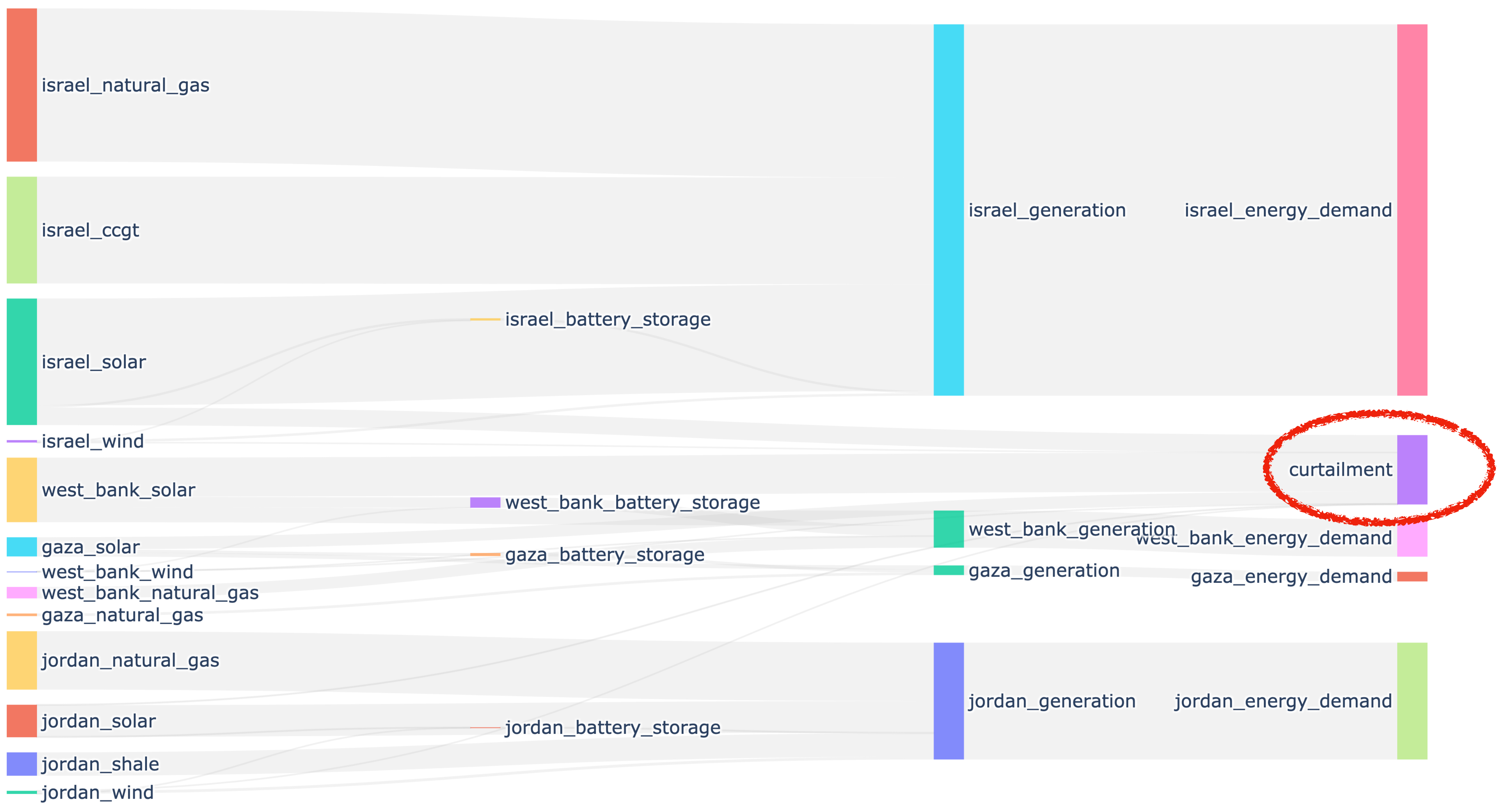
Cost of achieving total self-sufficiency in Palestine as a percentage of GDP

Electricity flows

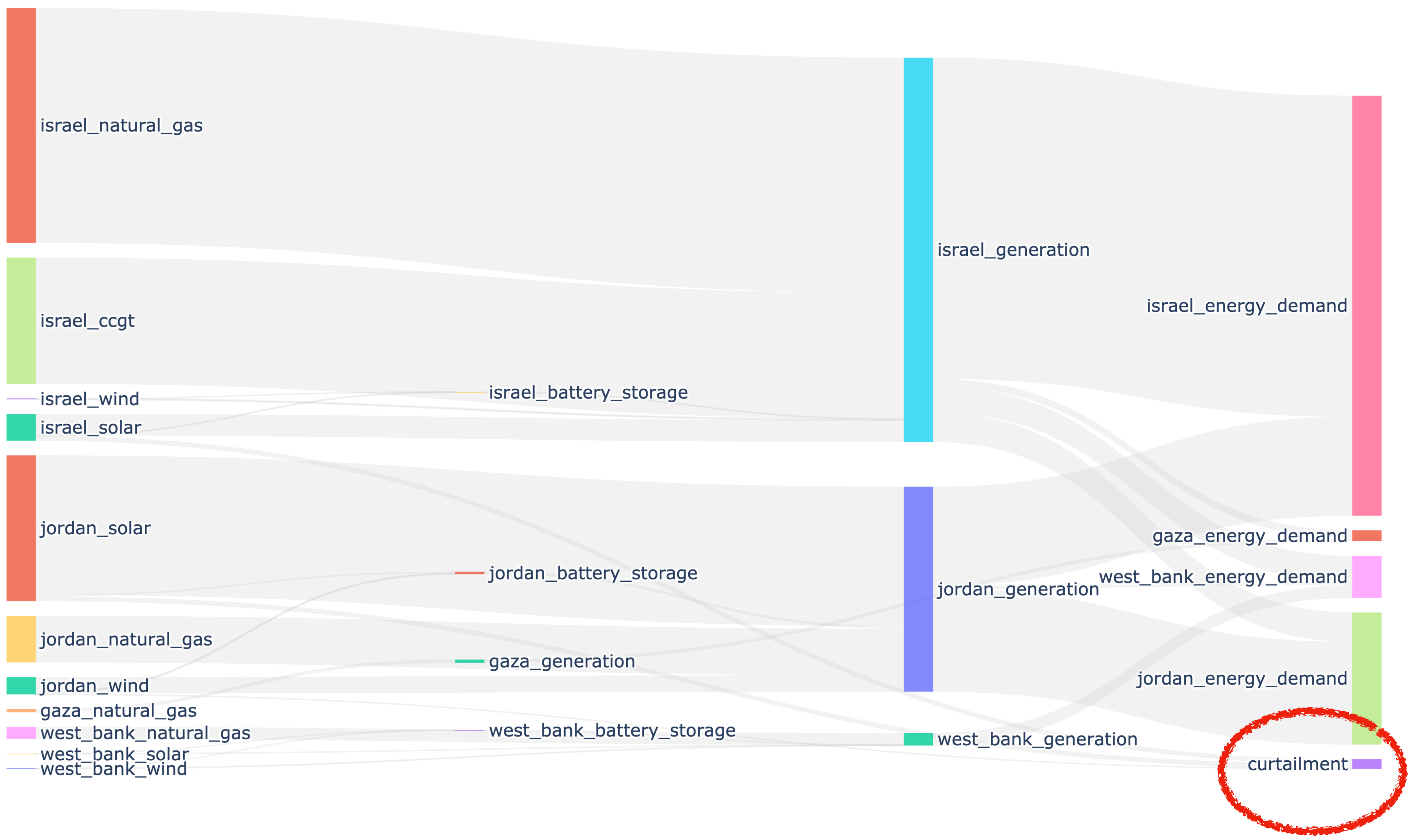
x20

More renewable curtailment in non-cooperative (NCO) operations compared with cooperative (COO) case

NCO

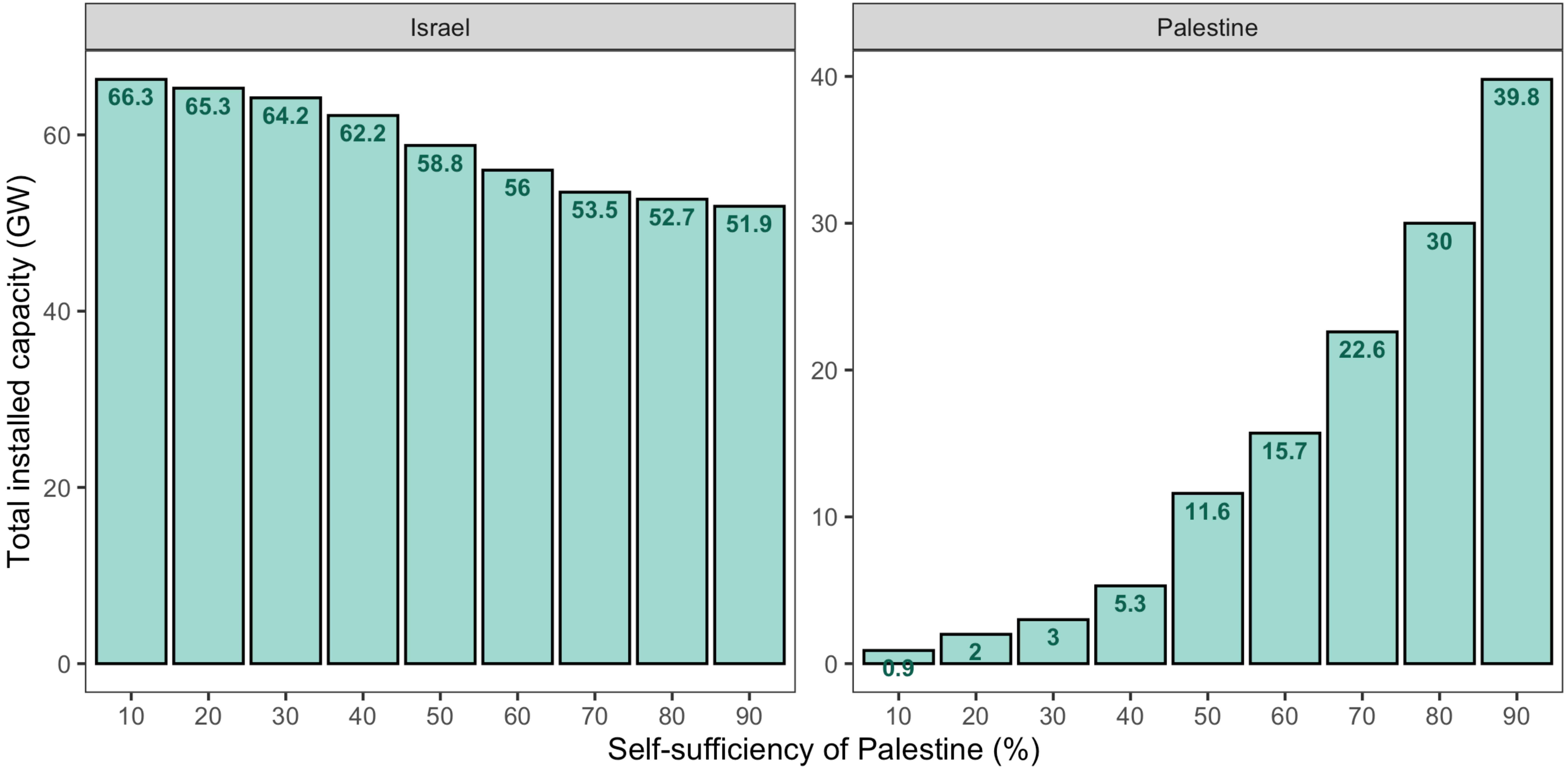


COO



Self-sufficiency

Capacity changes due to Palestine's self-sufficiency targets



20%

Reduction in Israel's total capacity requirements between 10-100%

x44

Total capacity increase in Palestine between 10-100% self-sufficiency

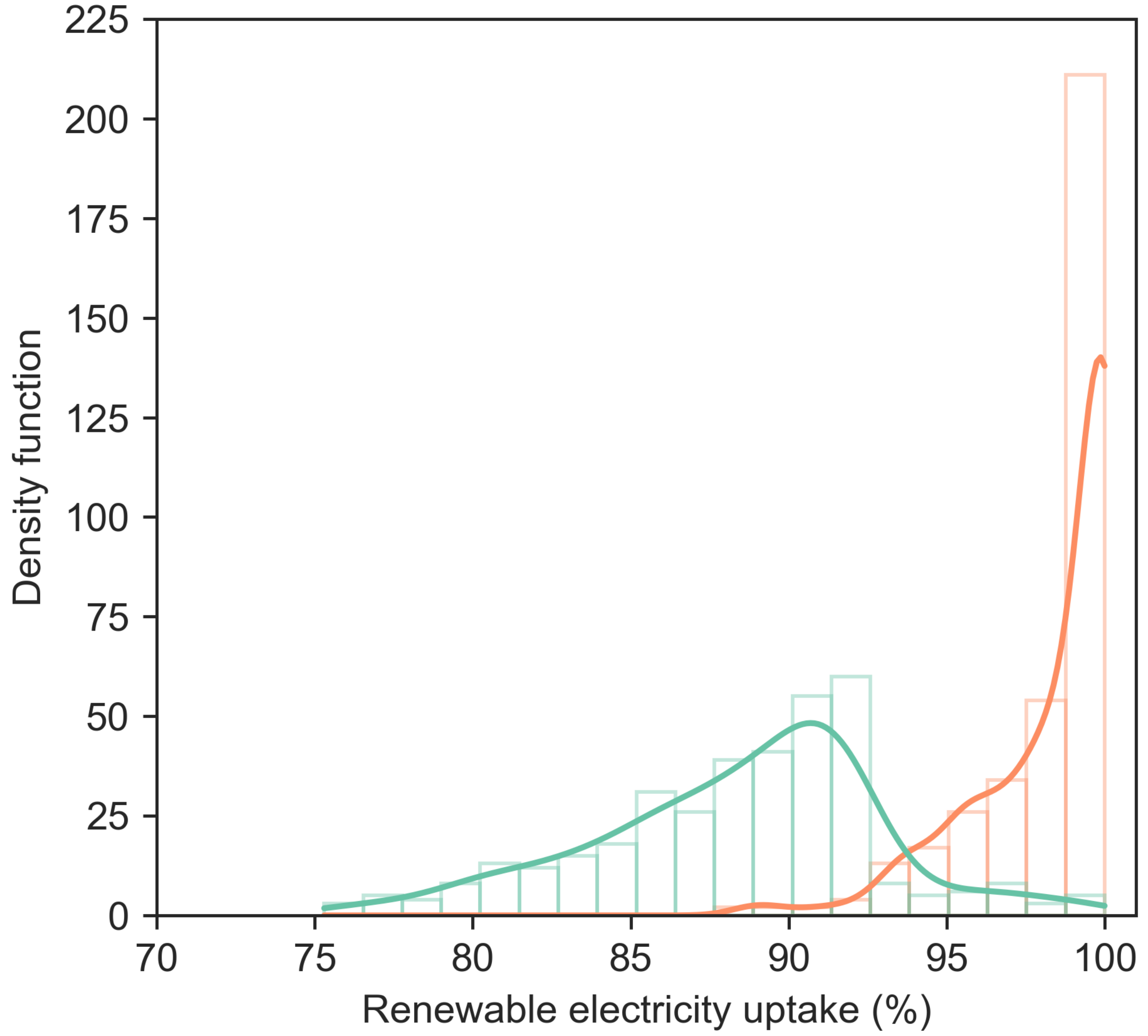
Based on current operational configurations (BAU)

Renewable uptake

Utilisation under non-cooperative and cooperative operations

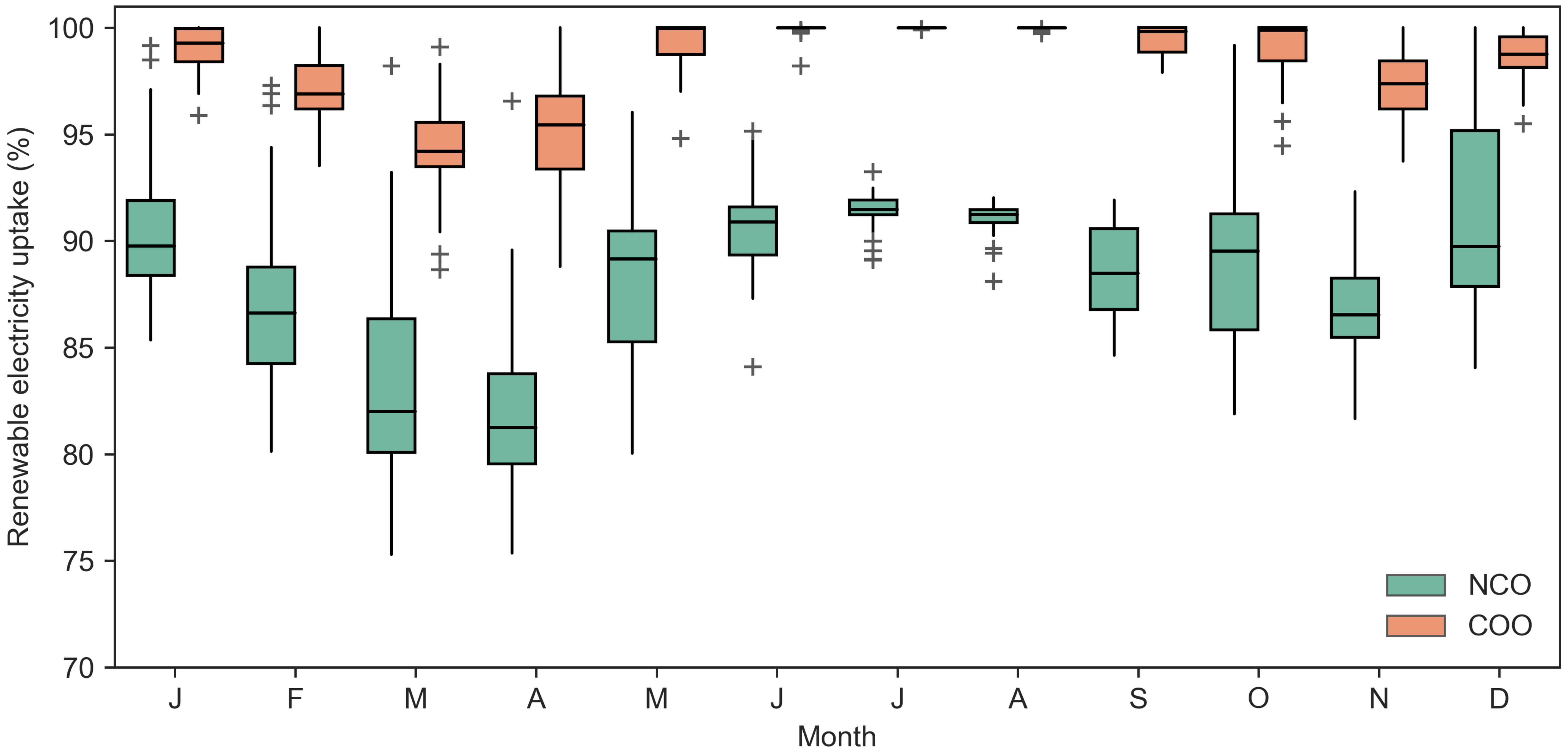
>90%

Daily renewable utilisation under COO



Jun-Aug

Generally exhibit greatest levels of renewable uptake. Excess supplies during Feb-Apr.



Deep decarbonisation

How could cooperation deliver net-zero?

XX%

Reduction in costs relative to current plan (BAU)

XXX

Cost increase for Jordan relative to current plan (BAU)

XXXX

Cost of achieving total self-sufficiency in Palestine as a percentage of GDP

Conclusions and next steps

Results

Summarising our findings

Cooperative (COO) energy planning and management has significant benefits:

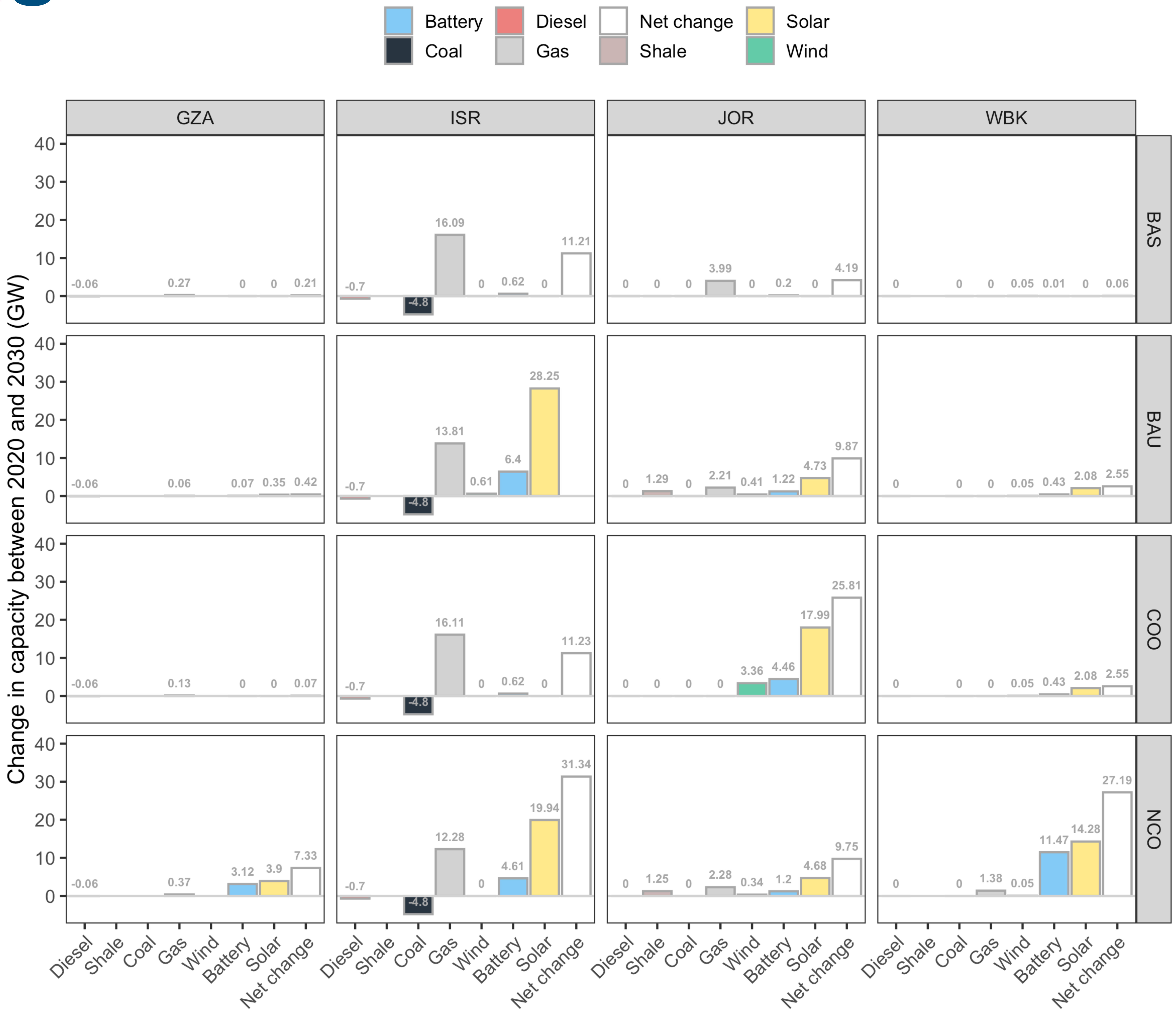
- Reduce costs by 28% compared to current plan (BAU)
- Improves renewable energy uptake and reduces curtailment

Pursuit of self-sufficiency (NCO) is challenging:

- Much higher renewable build-out with greater curtailments
- Costs almost twice as much as the cooperative case (COO)
- Very large costs for Palestine

Supporting slides

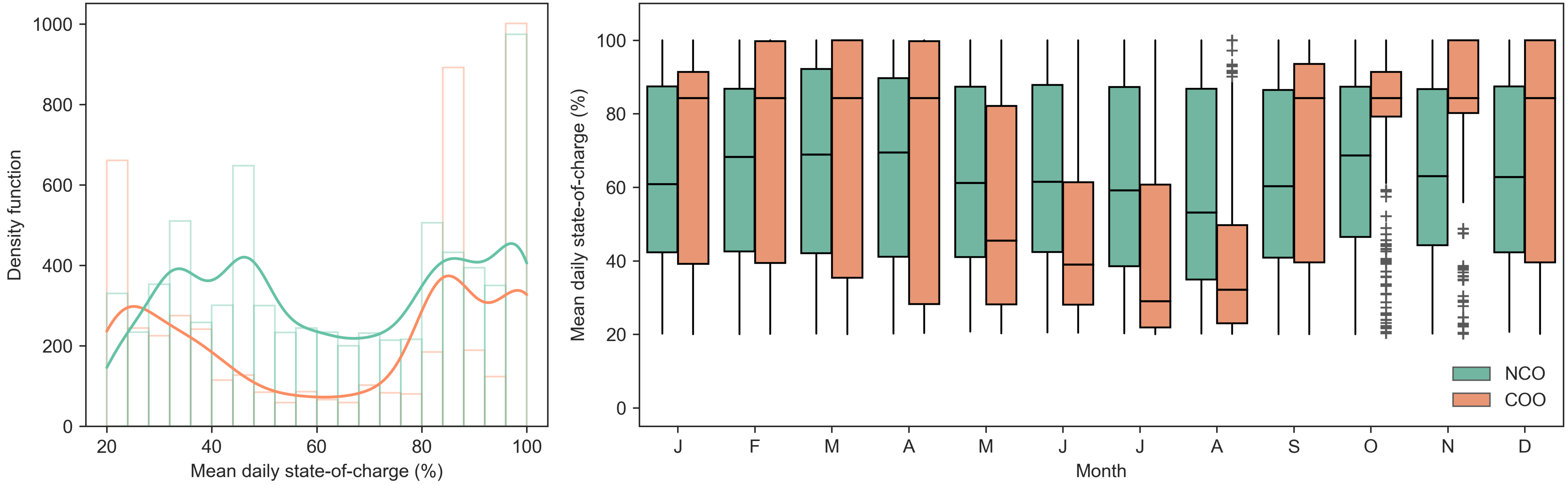
Capacities



Battery
Coal
Diesel
Gas
Net change
Shale
Solar
Wind
GZA
ISR
JOR
WBK
BAS
BAU
COO
NCO
Change in capacity between 2020 and 2030 (GW)
Diesel
Shale
Coal
Gas
Wind
Battery
Solar
Net change

Battery usage

State-of-charge (SOC) under NCO and COO



Need to further analyse:

The daily SOC under COO is generally lower; particularly around summer months. This helps RES uptake to increase — why does this not happen under NCO?

Figure: Emissions intensity (gCO2e/kWh) by fuel type