

# Assessing the energy system impacts of Morocco's NDC and low-emission pathways

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## 1 Introduction

In the last decade, Morocco has been at the forefront of the energy transition, through the ambitious pledges presented in COP21, the announcement of a 52% renewable energy target in 2030 and the launching of the world's largest CSP plant. Under its NDC, Morocco committed to unconditionally reduce its GHG emissions by 17% & conditionally by 42%, below business as usual emissions by 2030. The NDC strategy relies on energy sector transformation towards sustainable energy sources. There is strong political support of climate policy. The NDC ambition is ranked by the international community as among the highest globally and are aligned with the Paris goals. Moroccan institutions have built significant knowledge of innovative renewable energy financing instruments, especially for solar and wind projects.

Despite recent policy developments, Morocco's energy consumption is still dominated by fossil fuels (which are imported due to the lack of domestic hydrocarbon resources), while the expansion of coal-fired power generation raises concerns for in-creasing emissions. Morocco has vast renewable energy resources that can be exploited to replace fossil fuel use in and beyond the power sector, and thus the climate policy ambition can increase further.

## 2 Study Design

The energy and transport sectors represent more than 90% of Morocco's emissions and the country's goals rely mostly on energy system transformation. In line with Morocco's NDC, a Business-As-Usual (BAU) scenario is considered including only currently implemented policies without the measures included in country's NDC. The study analyses the impacts, costs and benefits for Morocco to achieve its NDC targets for 2030 and quantifies long-term low-emission Paris-compatible pathways for the country, in line with scenarios of the IPCC Special Report on 1.5oC.

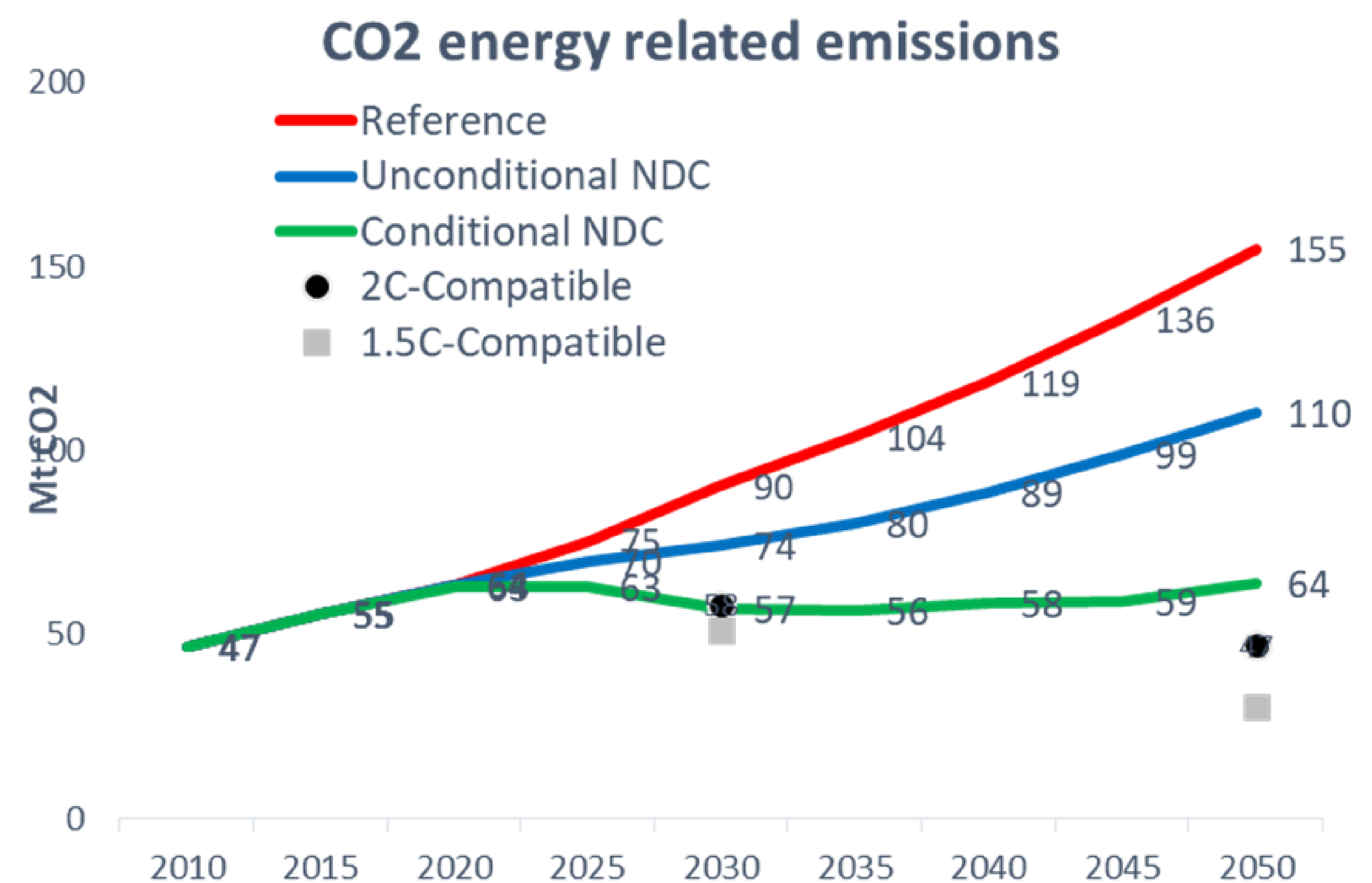
The policy scenarios are developed with the comprehensive. MENA-EDS model, which is a technologically rich energy system model capturing in detail the interactions between energy demand and supply. It provides future projections on energy consumption by sector and fuel, power generation mix, energy prices, policy instruments, energy investment and CO2 energy-related emissions. The study does not consider the new NDC of Morocco as submitted in 2021.

### Scenarios

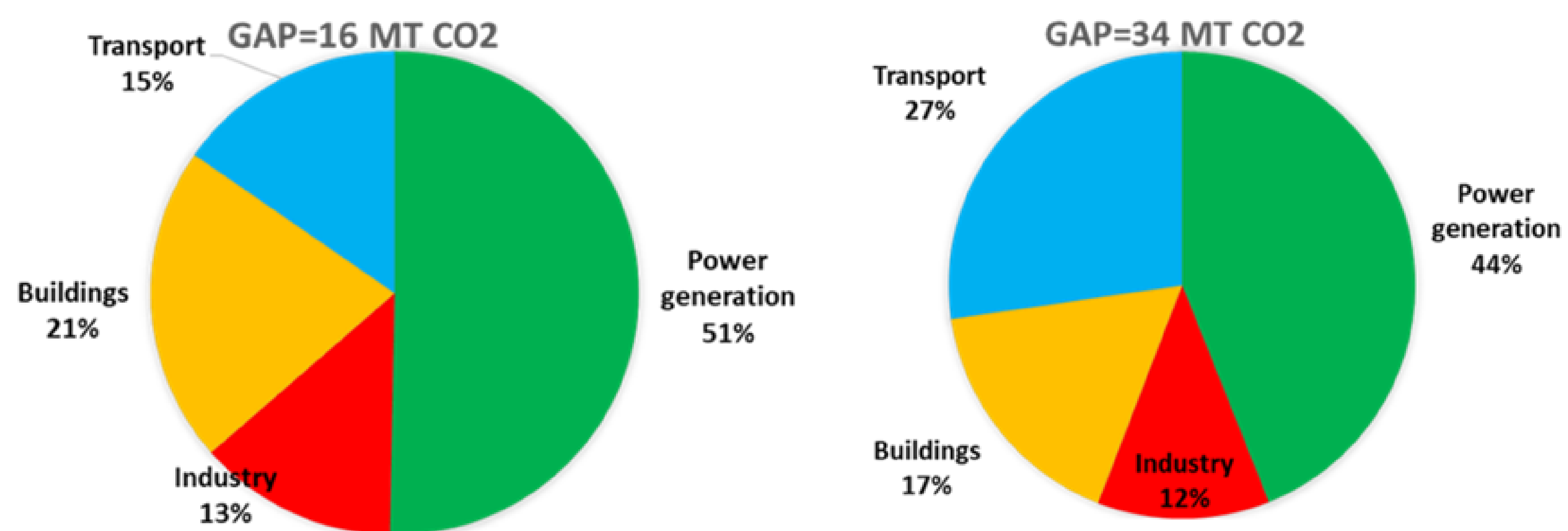
Scenario	Policy targets & Instruments
Reference (BAU)	Current policies and trends (no intensification)
Unconditional NDC	GHG reduce by 17% in 2030 from BAU
Conditional NDC	GHG reduce by 42% in 2030 from BAU
2C Compatible	Emission pathways compatible with 2C from MENA of the IPCC SR1.5 database
1.5C Compatible	Emission pathways compatible with 1.5C from MENA of the IPCC SR1.5 database

## 3 Results

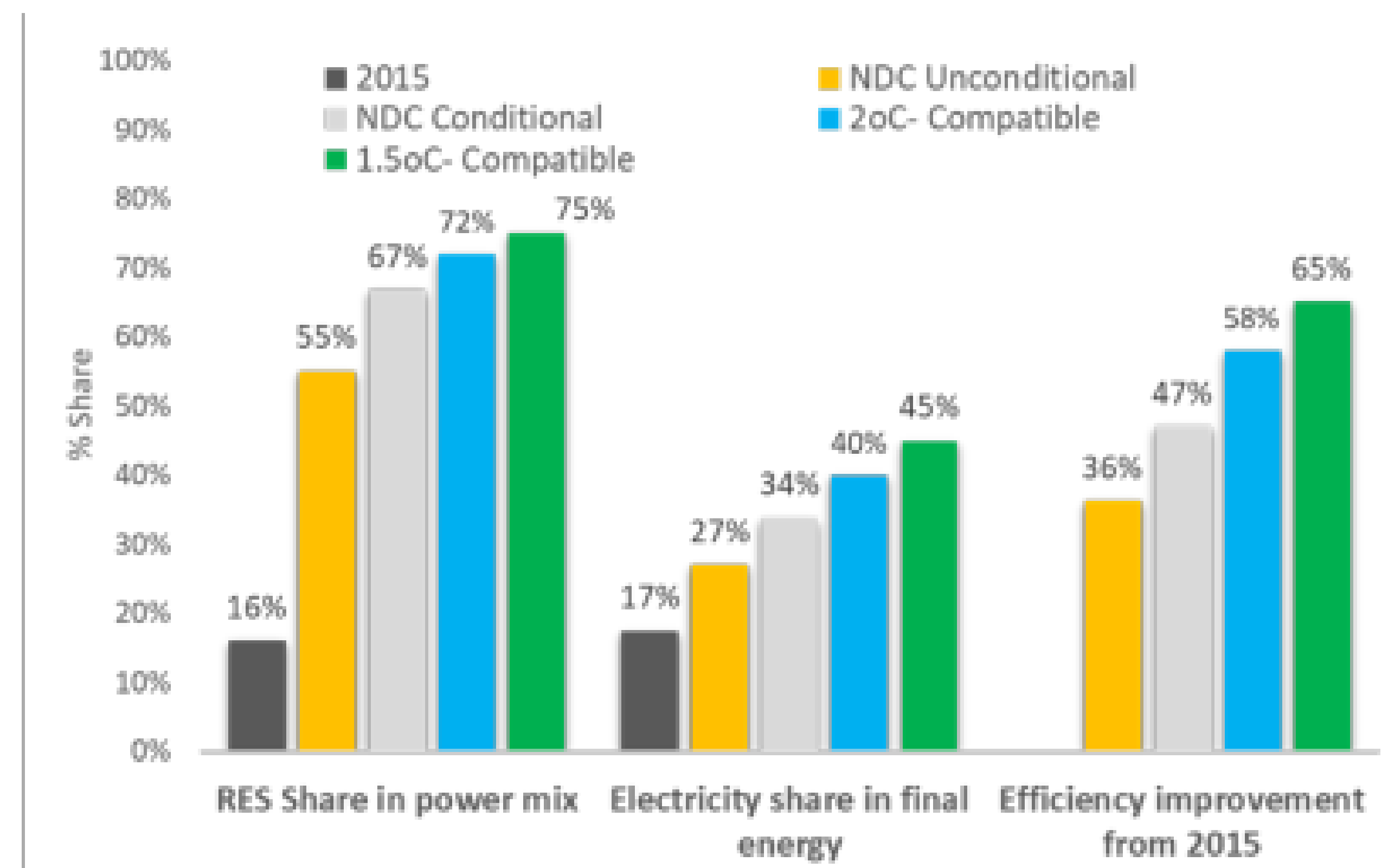
Morocco CO<sub>2</sub> emissions pathway over 2010-2050



Closing the ambition gap to achieve the NDCs



Morocco's energy system indicators under different scenarios



## 4 Discussion and Conclusions

- Morocco has set ambitious NDC targets for 2030, but current climate policies need strengthening to meet NDCs and long term low-emission strategies
- The energy system needs to be transformed by expansion of RE investment, higher levels of electricity use in transport, industry, and buildings, and a drive to use energy more efficiently
- The low-carbon transition can boost Morocco's economy, attract investment, create new jobs, and reduce energy imports
- While RES deployment in power generation progresses well, Morocco should also set targets for the use of renewable energy in residential and transport sectors