



وزارة الانتقال الطاقوي والتنمية المستدامة

وزارة الانتقال الطاقوي والتنمية المستدامة

Ministry of Energy
Transition and Sustainable
Development

Presentation 2024

MTEDD

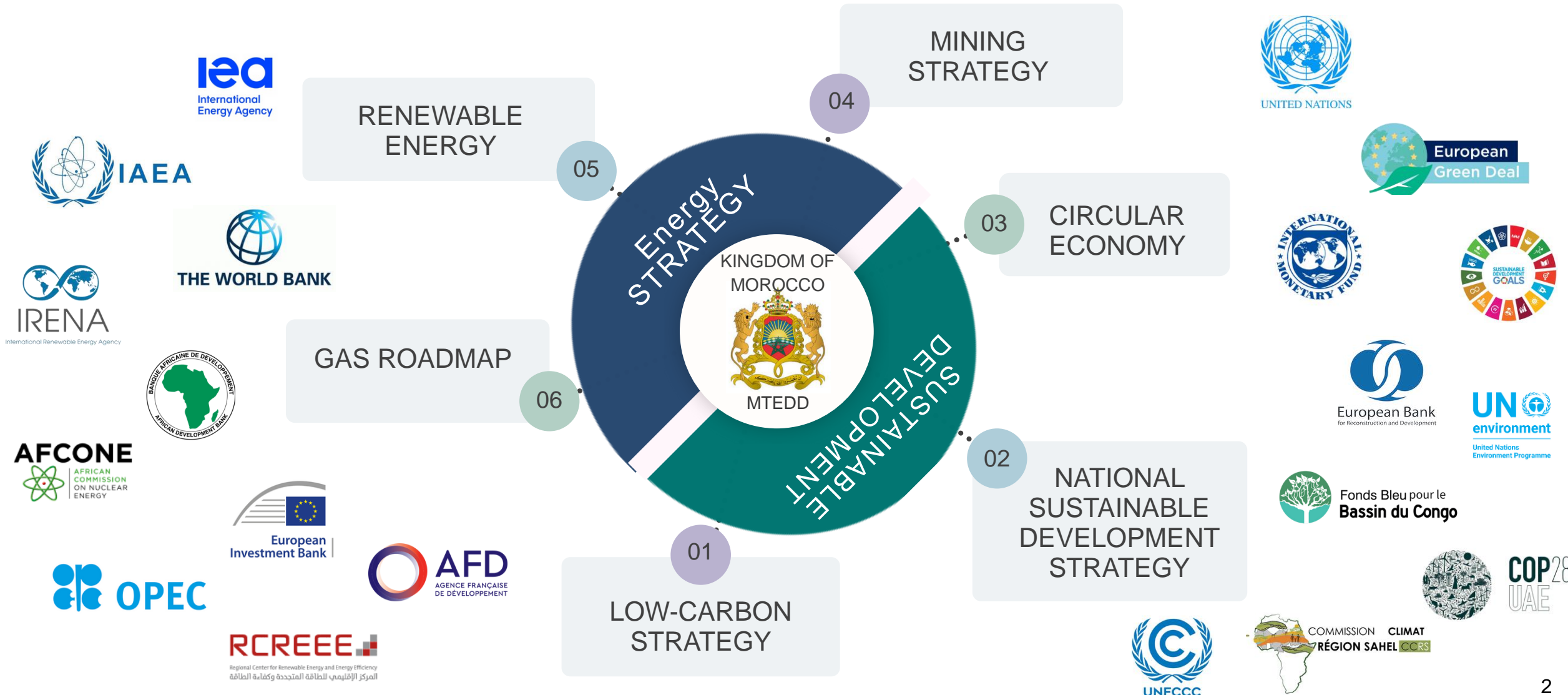
STRATEGIES



AGENDA



Ministère de la Transition
Énergétique et du
Développement Durable





Ministère de la Transition
Énergétique et du
Développement Durable

1. LOW-CARBON STRATEGY

1.1. International commitments



COP28 negotiations

- Tripling global renewable energy capacity and doubling the annual global rate of energy efficiency improvement by 2030.
- Gradual reduction of coal energy.
- Transitioning to zero or low-carbon fuels.
- Phasing out fossil fuels in a just, orderly, and equitable manner.
- Encouraging Parties to include ambitious large-scale emission reduction targets in their NDCs.

Glasgow Climate Pact

- Progressive Coal phase-down and phase-out

Nationally determined contributions (NDC)

- Morocco's updated National Determined Contribution (NDC) as of July 2021, showcasing a renewed level of ambition on both adaptation and mitigation fronts.

1.2. Morocco's Long-Term Low-Carbon Strategy - Horizon 2050



STRATEGIC ORIENTATIONS

- Accelerating the deployment of renewable energies.
- Increasing electrification and energy efficiency.
- Developing resilient and sustainable agriculture alongside forest ecosystems (carbon sinks).
- Promoting a new generation of resource-efficient 'smart cities' with zero-emission multimodal transport systems.

METHODOLOGY

- Establishment of assessments of the macroeconomic impacts of decarbonization scenarios and proposals for operational measures.
- Necessity for implementing technical levers.
- Integrated, collaborative modeling approach based on close national coordination with public and private stakeholders from the seven sectors, financial sector, local authorities and civil society.

7

Covering
Key Sectors

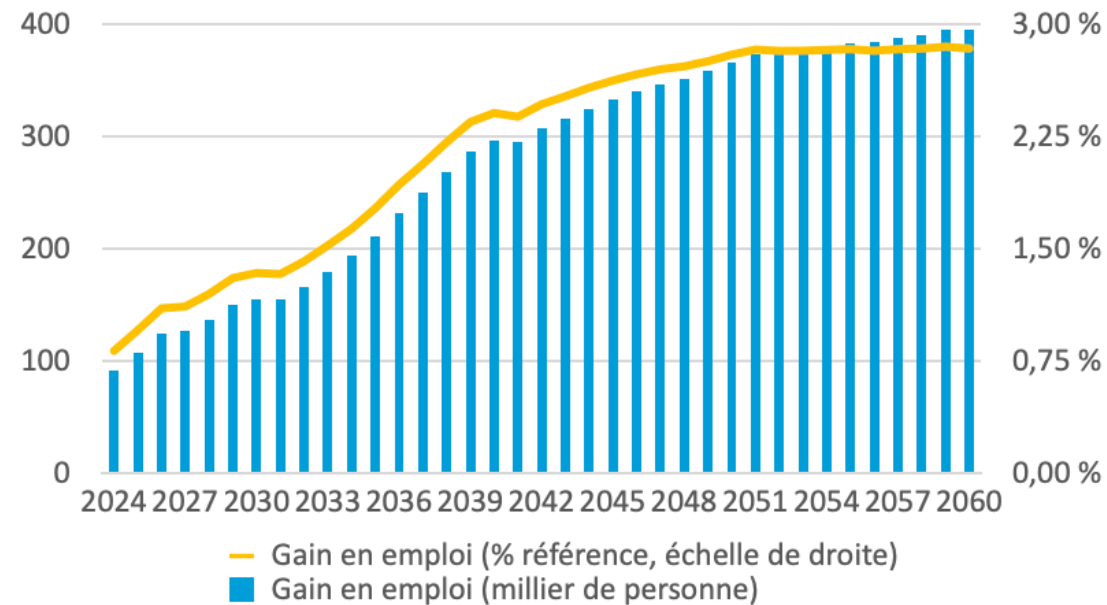


1.3. Energy transition in favor of decarbonization



Modeling in progress

Created jobs



Impacts of the net-zero trajectory

- Creation of 400,000 jobs
- 5% GDP growth
- Reduction in imports of fossil fuels



Ministère de la Transition
Énergétique et du
Développement Durable

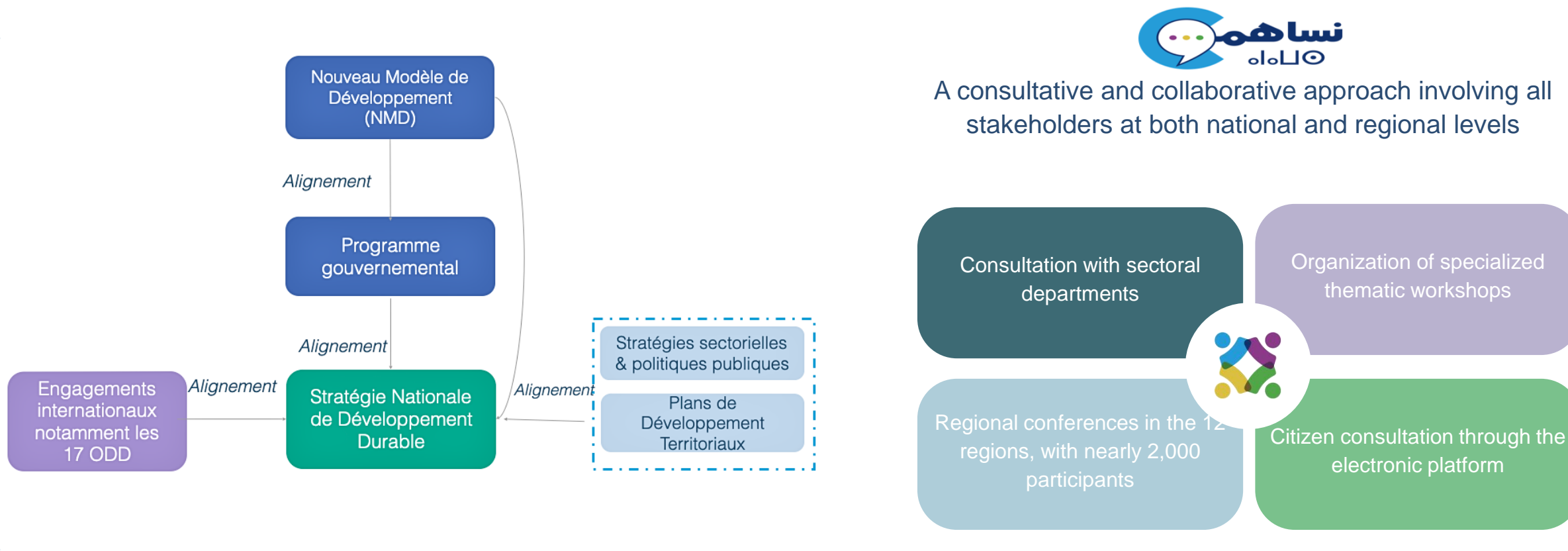
Sustainable development

2. National Strategy for Sustainable Development

2.1. Roadmap for the National Strategy for Sustainable Development Revision



NSSD : Tool for Steering the Trajectory of Sustainable Development in Morocco Towards 2035



2.2. Revision of the Strategy

Vision for 2035:

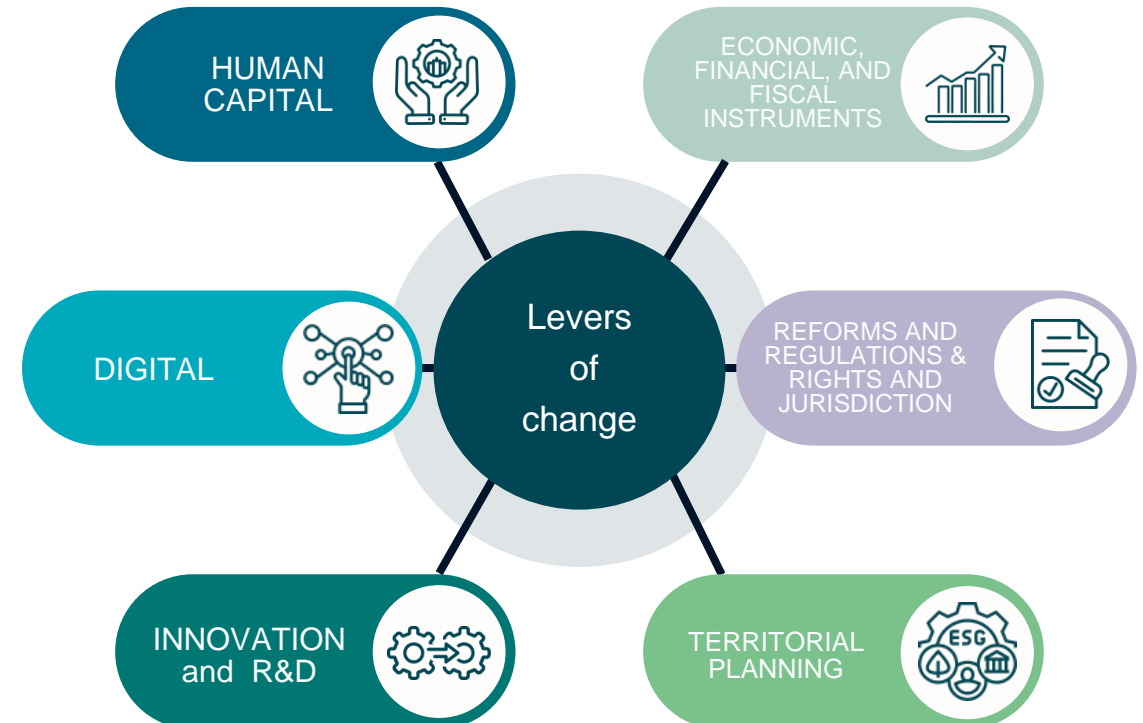
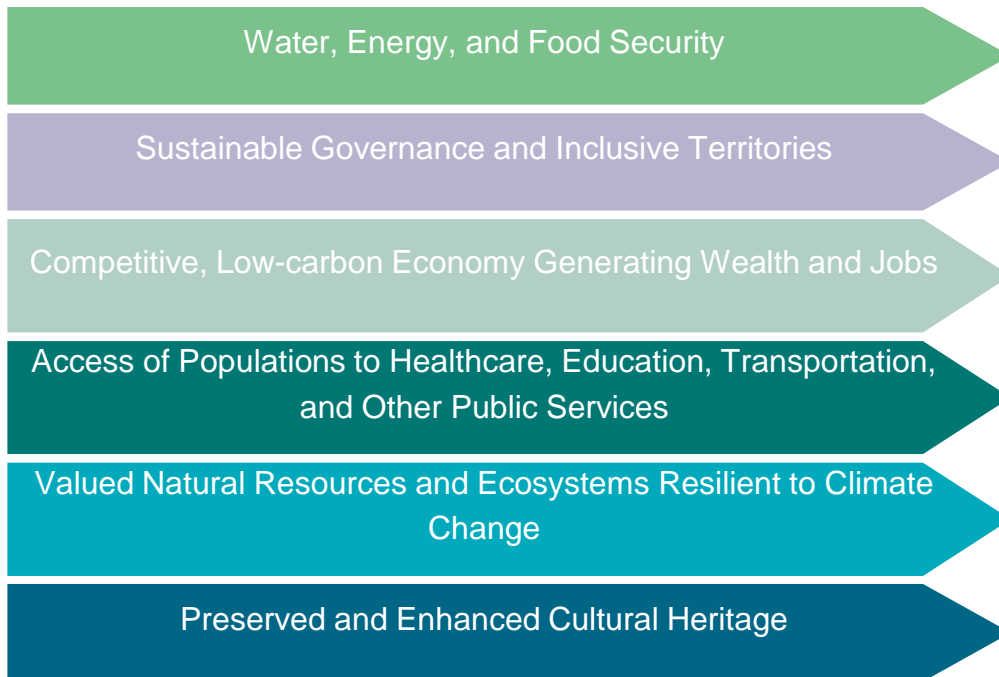
'As Moroccans, bold and enriched by our cultural heritage and natural and economic capital, we strive for the equitable development of our territories, promoting inclusion, sustainability, and intergenerational solidarity.'

Sustainable, participatory, and cross-cutting governance

2 Foundational Pillars

Citizens sensitized, involved, and committed in the long term

Areas of Transformation



2.3. Examples of national indicators



Energy dependency rate

Female employment rate



Investment volume in mineral exploration and research

National recycling rate for household and similar waste (%)



Literacy rate of population aged 15+ by gender

Economic losses due to natural disasters and extreme events (as % of GDP)





Ministère de la Transition
Énergétique et du
Développement Durable

SUSTAINABLE DEVELOPMENT

3. CIRCULAR ECONOMY



3.1. Transition to a circular economy in Morocco



Law 28.00

- In progress: Draft amendment to the law on waste management and disposal
- Waste management planning
- Waste reduction at source
- Introduction of a selective collection system
- Energy recovery from waste
- Integration of the principle of **extended producer responsibility (EPR)**

National household waste program (PNDM) 2008-2022

- 96% of household solid waste professionally collected
- 29 controlled landfills, corresponding to 66.6% of treated capacity and serving 283 territorial communes
- 13 waste sorting and recycling centers

Wastewater treatment

1. Wastewater treatment for two industrial zones in Ain Johra (Khemisset) and Bouknadel (Salé)
Total cost: 88 MDH
2. REUSE Rabat
 - Treated wastewater production plants for watering green spaces
 - 5 treatment plants with a total capacity of 46,000 m³/d

Extended Producer Responsibility

An environmental policy approach in which a producer's responsibility for a product extends to the post-consumer stage of its life cycle, to encourage them to take environmental considerations into account throughout the production processes of the product chain.

3.1. Transition to a circular economy in Morocco



Ministère de la Transition
Énergétique et du
Développement Durable

Vision 2030

“Integrated approach for the entire value chain”

Selective waste collection

Recycling and Eco-Elimination

Valorization Promotion

- **30%** recovery of household waste.
- Adoption of a specific management method adapted to **communes whose waste quantities do not exceed 50,000t/year**.
- Implementation of projects in the **six cities that will host the 2030 World Cup**, requiring an estimated budget of over **7 billion dirhams**.

3.2. Memorandum of understanding on the recovery household and similar waste in RDF



Establishment of a state-controlled “Central Actor” bringing together all stakeholders at state level

Main missions

1. Implement the national strategy for household and similar waste management and translate it into action plans
2. Technical and financial support for local authorities
3. Regulation management

The Memorandum of Understanding applies in particular to the cement sector

Production of RDF (Refuse-derived fuel) from waste (between 660,000 and 680,000 tonnes of alternative fuels will be produced for use in cement plants)

The total amount of state subsidies is estimated at 3 billion dirhams by 2030.



Ministère de la Transition
Énergétique et du
Développement Durable

ENERGY STRATEGY

4. MINING STRATEGY

4.1. For a Reform aimed at a paradigm shift paradigm shift in the sector



IMPORTANCE OF THE DOMESTIC SECTOR

A varied geological structure rich in minerals

- Phosphates
- Phosphate derivatives
- Mines (e.g. Cobalt)
- Quarries (e.g. Marble, Taza Stone, Ceramics)

01

Mining activity throughout the Kingdom

- Global mine production + 30 million tonnes
- Global mining investment + 20,000 MDH
- Exploration permits: 4620
- Mining permits: 1297

02

A place of choice for mining other mineral substances

- Barite 4th in the world and 1st in Africa
- Silver 17th worldwide and 1st in Africa
- Fluorite 6th worldwide and 2nd in Africa

03

A major economic contribution

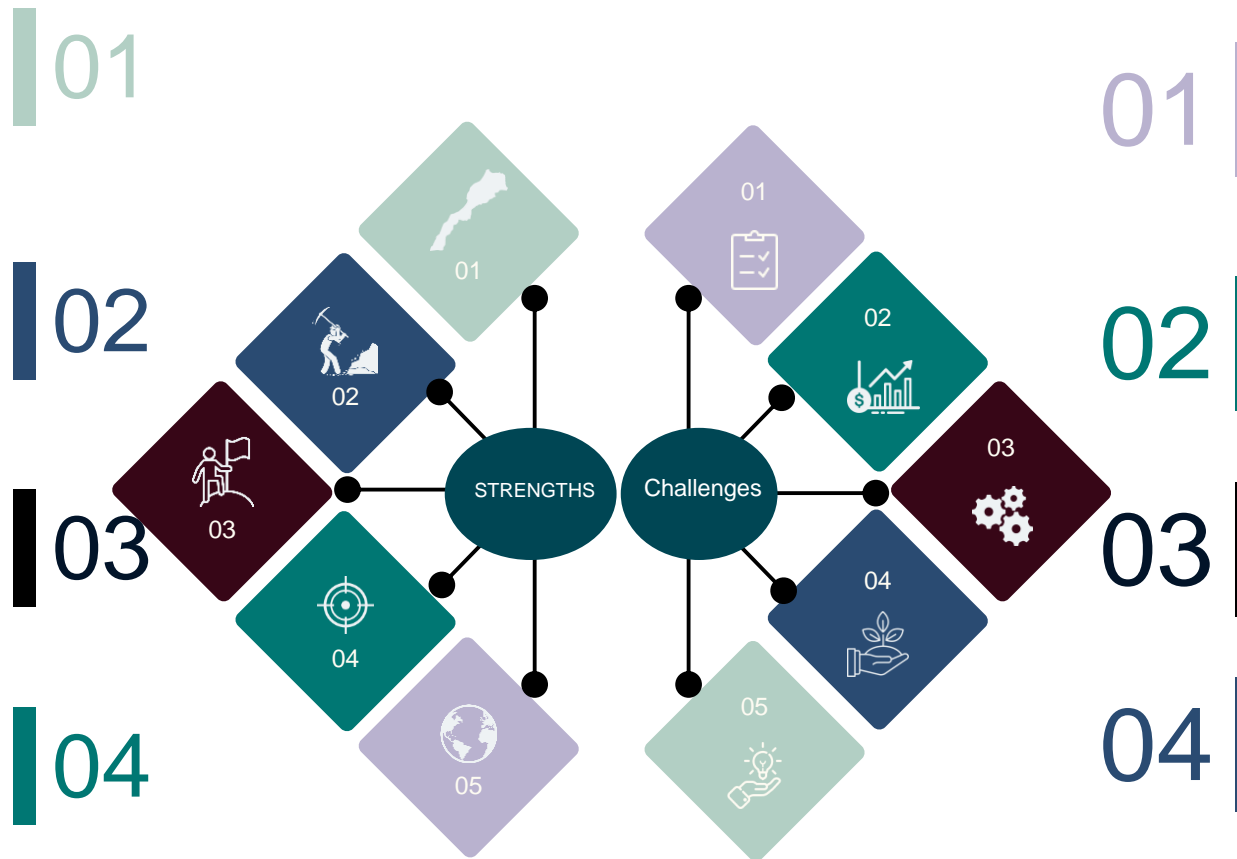
- 7 to 10% of GDP
- 27.7% of national exports
- Positive impact on transport and port dynamics
- 50,783 jobs generated

04

70% of the world's phosphate reserves

- Production: 30.457 MT
- Investment: + 20 MDH
- Exports: + 110 MDH
- Share in national exports (by value): 26

05



SEVERAL CHALLENGES

01

Modernization and competitiveness of the non-phosphate mining sector

02

Investment attractiveness

03

Improving the level of valorization and transformation on an industrial scale

04

Increasing the impact of mining projects on local areas and meeting sustainability and safety requirements

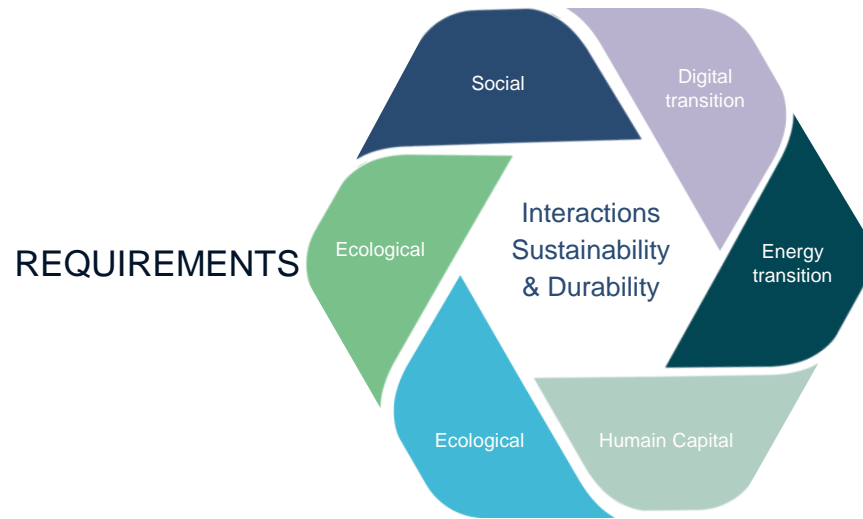
05

Development of innovation and applied research

4.2. Strategy, Vision, Action Plan & Monitoring



A REFORM DESIGNED TO BRING ABOUT A PARADIGM SHIFT IN THE MINING SECTOR



INDUSTRIALIZATION
FROM
COUNTRY

Tryptique
“Energy Transition, Digital
Transformation and Human Capital
Development”

O
B
J
E
C
T
F
S

1

Integrating mining policy into Morocco's industrial development policy

2

Enhancing the value of strategic and critical minerals and metals

3

Invest massively in knowledge and the development of mining intelligence

4

A sustainable mining sector (ESG benchmark)

5

Implement a regional/continental positioning and influence strategy for Morocco through the mining sector

4.3. Strategic areas of transformation



6 priorities for repositioning the mining sector in the Moroccan economy



INSTITUTIONAL RESTRUCTURING

- Regalian missions
- Local mineral processing



DIGITIZING & SIMPLIFYING PROCEDURES

- Dematerializing access to information
- Digital platform
- Online licensing procedures
- Digitization of the mining cadastre
- Provision of cartography



VALORIZATION & INDUSTRIAL TRANSFORMATION

- Geo-scientific infrastructure
- Restructuring of craft activities



LEGISLATIVE & REGULATORY REFORM

- Strategic and Critical Minerals (Commission Nationale des MSC)
- Conditions for granting and renewing licenses



INVESTMENT ATTRACTIVENESS

- Support for economic operators
- Mining SMEs
- Job creation



RESPONSIBLE REGIONAL DEVELOPMENT & SOCIAL IMPACT

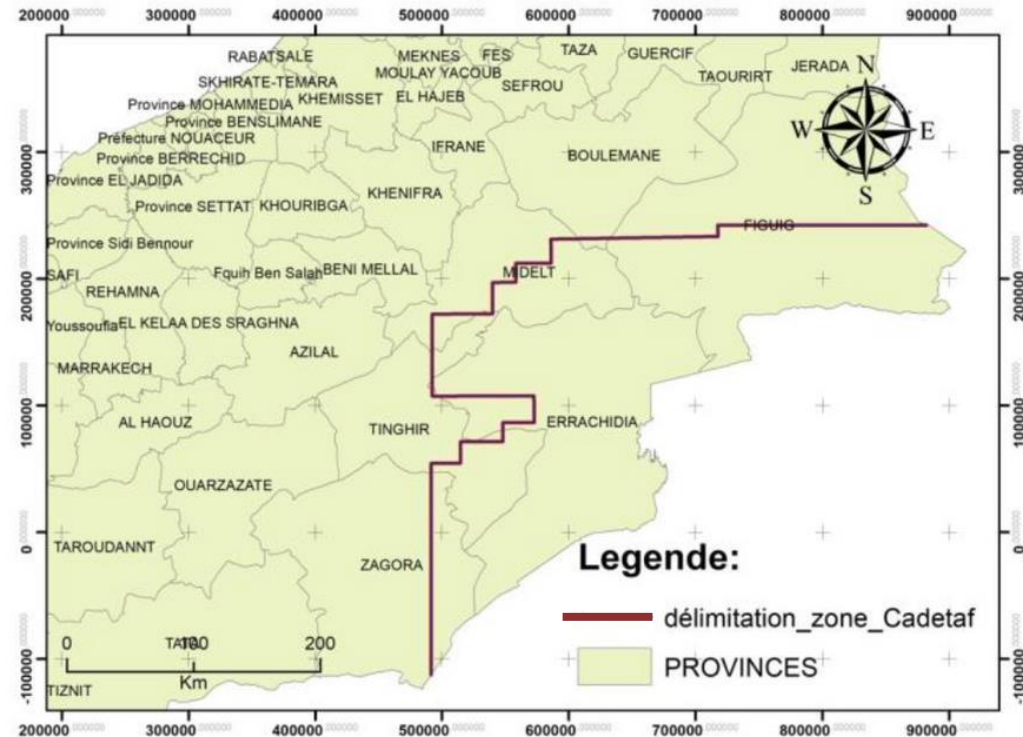
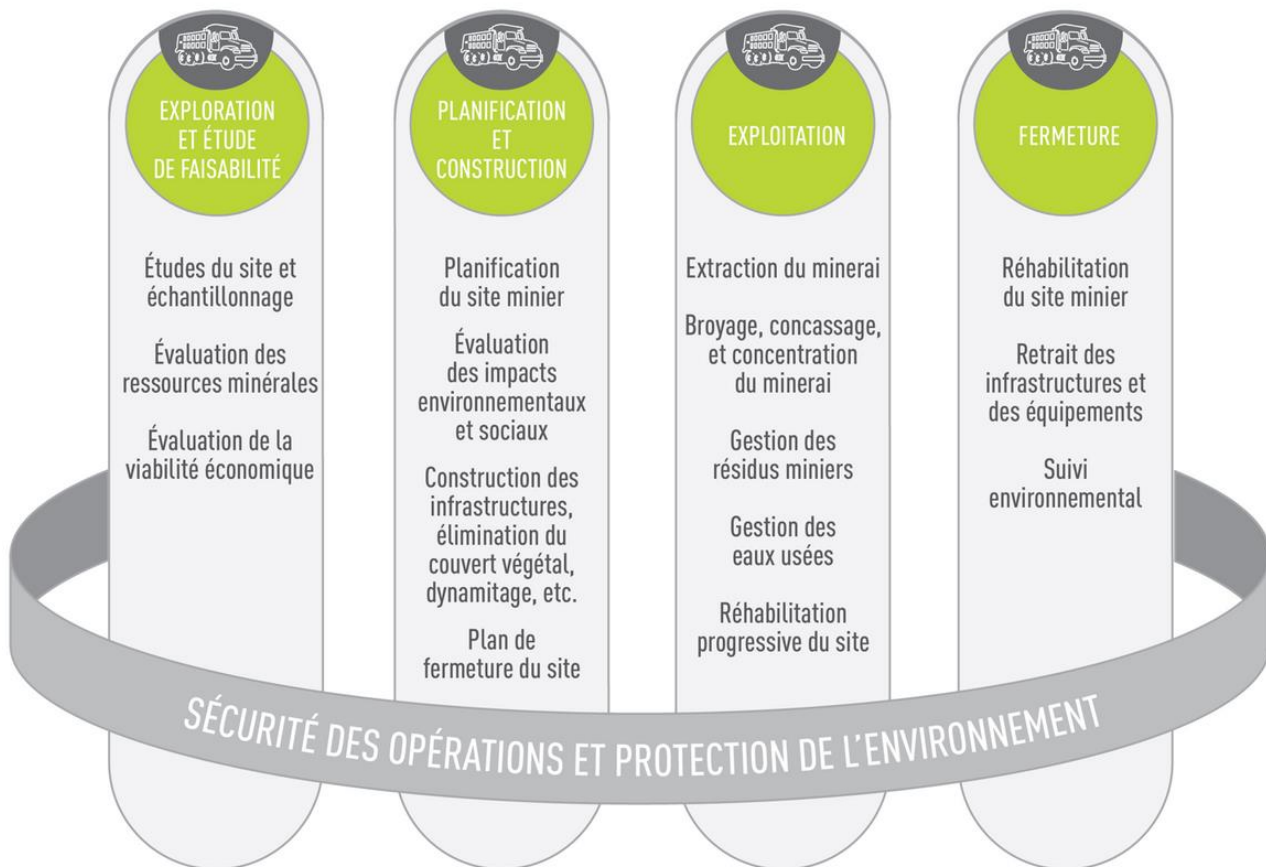
- Local content and community development
- Industrial integration

4.4. Projects



1. CADETAF

LIFE CYCLE OF A MINING PROJECT (INDUSTRY PERSPECTIVE)



- Area: 58,799.21 km² in the provinces of Errachidia, Figuig, Tinghir, Midelt, Zagora and Boulmane
- Annual production (Pb, Zn, Ba): approx. + 600 KT
- Sales: over 400 million DH
- Craftsmen and workers: + 2500



Ministère de la Transition
Énergétique et du
Développement Durable

ENERGY STRATEGY

5. RENEWABLE ENERGIES

1.5. Energy Strategy - 3 pillars



RENEWABLE ENERGIES



ENERGY
EFFICIENCY

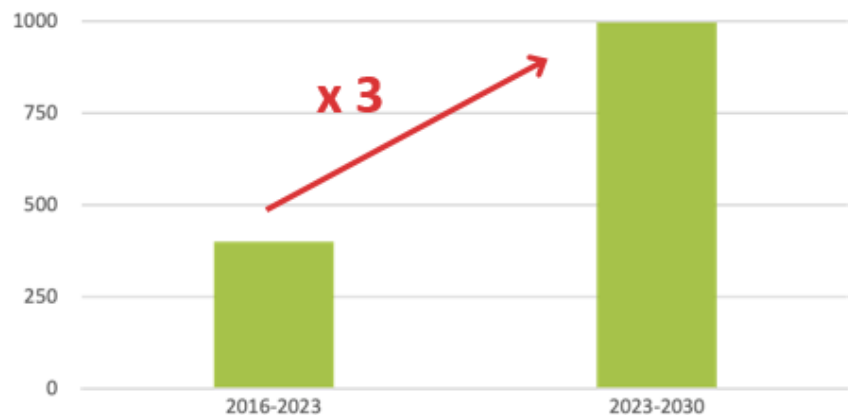


REGIONAL
INTEGRATION

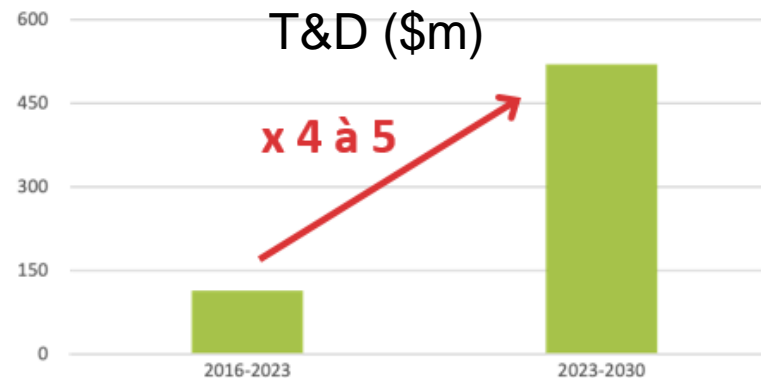
5.2. Accelerating investments - Energy Strategy 2009 update



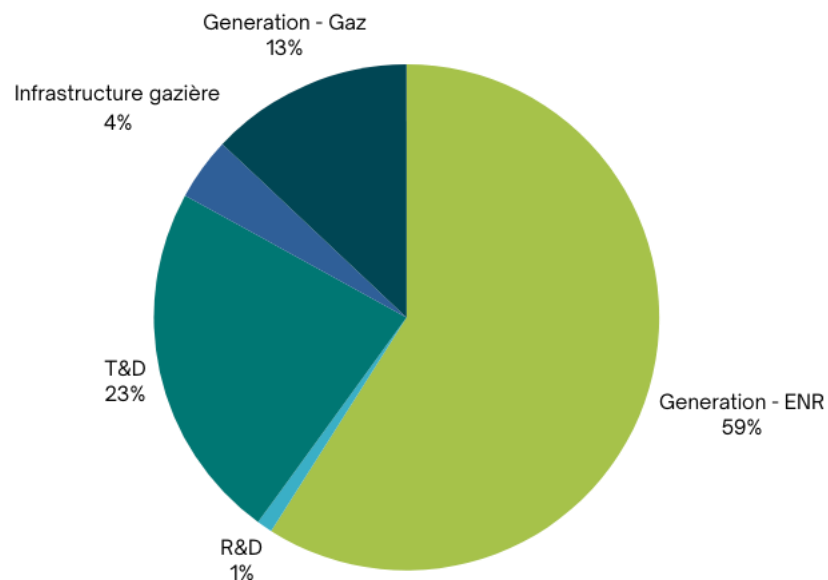
Average annual investment in power generation (\$m)



Average annual investment in T&D (\$m)



Share of investments by Sector



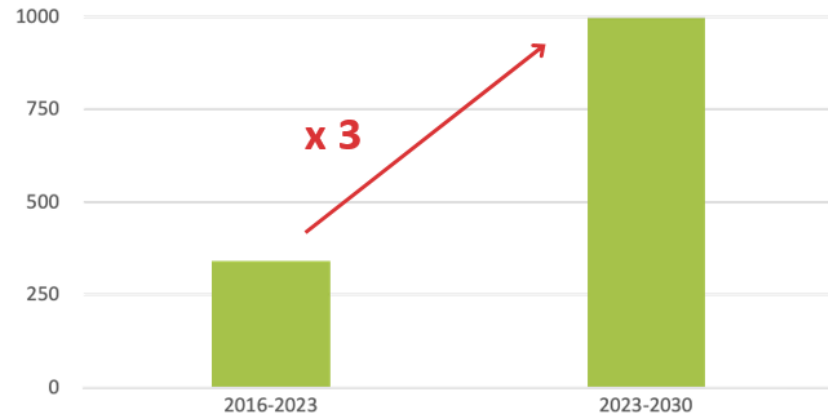
Need to continuously invest
over \$1 billion per year in the
sector for business as usual



5.3. ENR - Acceleration strategy

Projects 13-09

capacités ENR ajoutées per year (MW)



- New legislative framework in force (Law 40-19 and Law 82-21)
- Clearer understanding of network reinforcement needs with opening to the private sector
- Opening of TM effective since publication of the decree (2021, co-signed by the Ministry of the Interior)
- ANRE to publish transport tariffs and system services (as required by law)

Projets

MASEN

- Noor Midelt 1 - release
- Noor Midelt 2 and 3 - tenders 2024
- At least 3 GW - 2024 - 2029

Project	Description	Estimated investment (\$m)
"3 GW North-South electricity "highway"	Direct-current (e.g. HVDC) power link, approx. 1600 km long	1800
Transmission network reinforcement (cables and transformer substations)	Reinforcement of 400kV lines (1500km+) and investment in new transformer substations + Smart Grids	1600
EI Menzel and Ifahsa WWTPs	2 pumped storage power stations (2 x 300 MW)	2 x 300m



Ministère de la Transition
Énergétique et du
Développement Durable

ENERGY STRATEGY

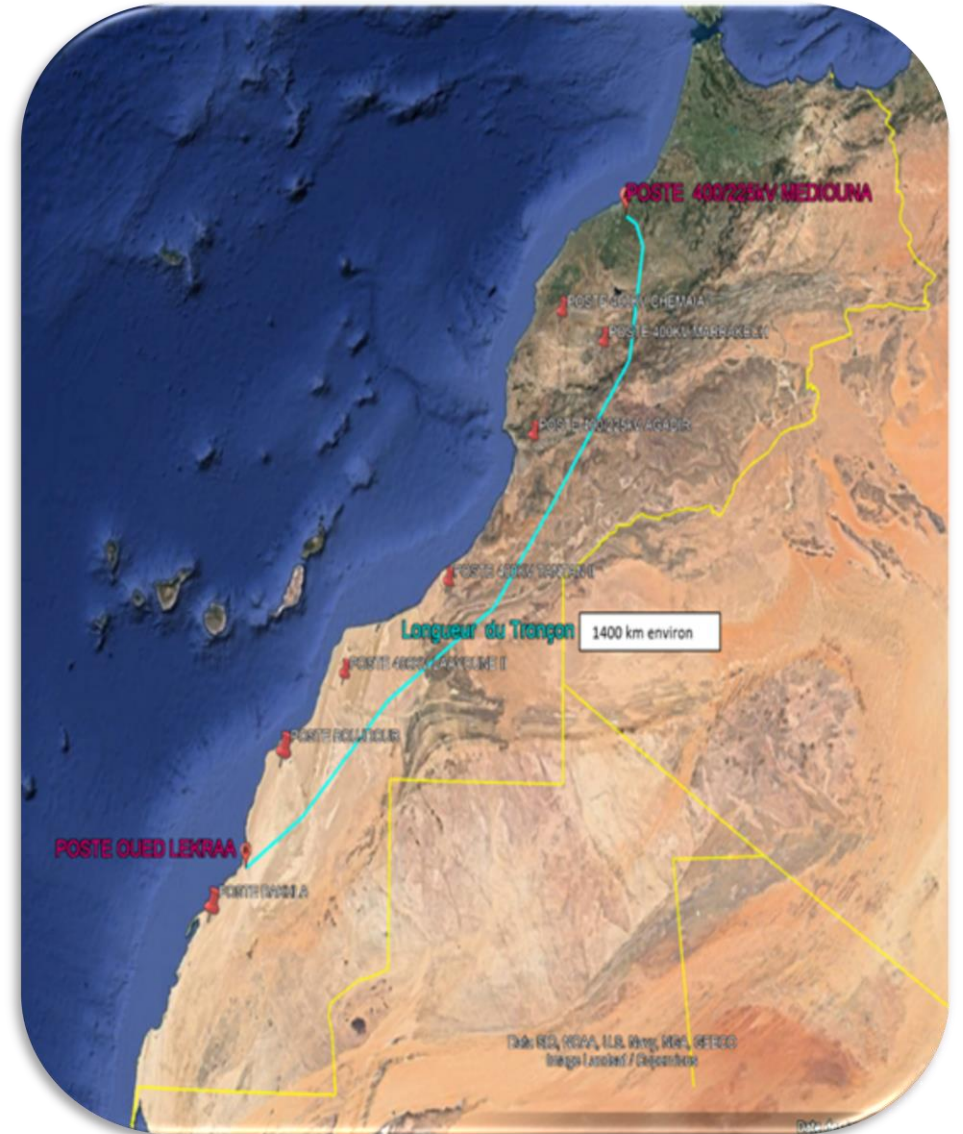
6. Grid infrastructure

6.1. Morocco's Grid Investment Program



- Strengthening the 400 kV Network to support Renewables integration: The total investment for ONEE's transmission power grid from 2024 to 2030 is estimated at approximately USD 3 bn, excluding the 3 GW South-Center transmission project.
- South-Center 1400 km transmission line (3GW): open to private operators in a PPP model (estimated Capex of USD 2bn).

Building a modern electrical grid for the
Atlantic corridor



6.2. Regional Interconnections to strengthen the future corridor



Planned interconnections

- 3rd electrical interconnection with Spain – 700 MW
- Electrical interconnection project with Portugal – 1000 MW
- Electrical interconnection with Mauritania – under study

Other interconnections under consideration (exchange of green electrons)

- UK
- France
- Italy





Ministère de la Transition
Énergétique et du
Développement Durable

ENERGY STRATEGY

7. GAS ROADMAP



7.1. Gas roadmap – Context



Significant need for natural gas in the short and medium term

- Existing industrial needs in the Kenitra area (critical situation with depletion of Gharb deposits managed by ONHYM/SDX)
- More than 2.5 GW of new thermal gas capacity under ONEE's capital expenditure plan to 2027
- Industrial development of certain activities as a first step before using hydrogen (float glass, steel, etc.).



Strategic objectives

- Consolidating the Kingdom's energy independence
- Contribute to the decarbonization of the Moroccan electricity system by using natural gas as a transitional energy source (phasing out fuel oil and reducing coal consumption).
- Fostering the development of "decarbonized" domestic industry
- A flexible infrastructure that can be used in the long term to transport and/or deristify green hydrogen.



State constraints and priorities

- Rapid deployment of the first phase (design and implementation)
- "Project bankability (coordinated risk management)
- Minimization of the state's financial contribution, with a decisive role for the national and international private sector (PPP)

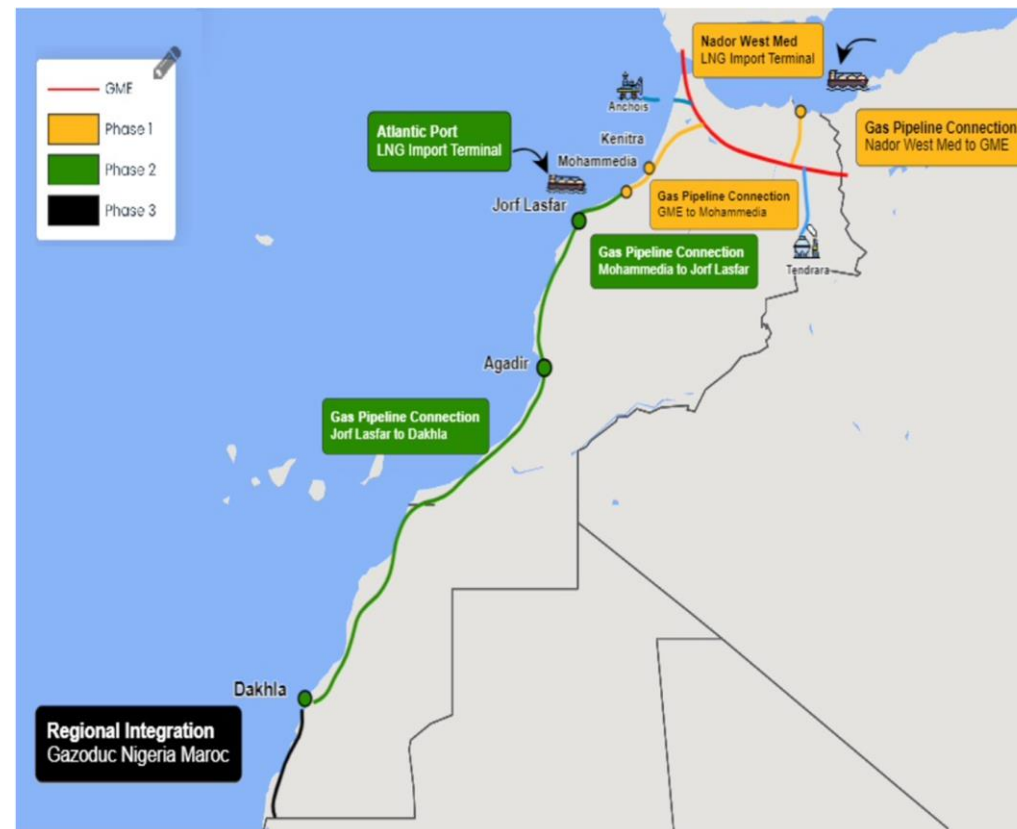
7.2. Gas Roadmap - Version 2024



Key principles of the new Gas Act

- Supporting the development of the downstream gas sector with an organization adapted to an embryonic market
- Regulation
- Goal: Develop gas infrastructure
- Separation of activities and creation of a TSO (Transmission System Operator)

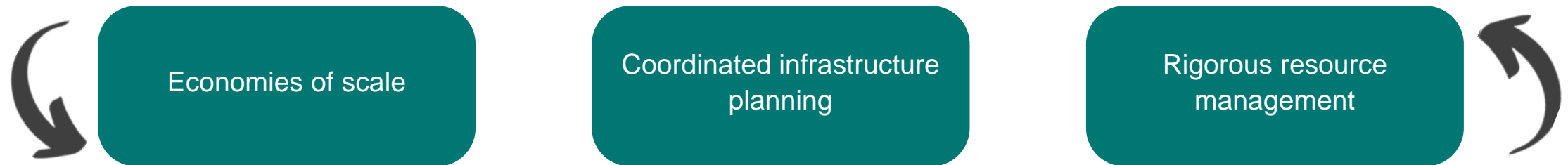
<p>Short term (2024-2026)</p>	<p>1. <u>Domestic production</u>: construction of pipelines to connect the Tendirara and Anchois production projects to the Gazoduc Maghreb Europe pipeline</p> <p>2. <u>New LNG entry points</u>:</p> <ul style="list-style-type: none"> ➤ <u>Port Component</u>: Tender, construction and commercial operation start of an LNG regas terminal at the port of Nador West Med ➤ <u>Pipeline Component</u>: Tender, construction and commercial operation start of natural gas pipelines from NWM Port to the GME and from the GME to Mohammedia ➤ <u>Module 3</u>: Update of pre-feasibility study of an LNG regas terminal on the Atlantic coast
<p>Medium term (After 2030)</p>	<ul style="list-style-type: none"> • Module 3: delivery of the Atlantic coast LNG regas terminal • Module 4: development of an LNG regas terminal at Dakhla Atlantic port • Module 5: construction of further pipelines to connect the gas network
<p>Long term</p>	<ul style="list-style-type: none"> - <u>Regional integration</u>: connection to the Mauritanian and Senegalese gas networks through the African Atlantic pipeline - <u>Green hydrogen expansion</u>: harness synergies with green hydrogen and by-products



7.3. Competitiveness of green hydrogen - A long-term issue



Focus on key success factors for competitive hydrogen <\$1-2/kg



Years	Coast of renewable eper \$/MWh	Induced electrolysis capacity in GW	Investment cost for electrolysis in \$/kW	Cost of hydrogen in \$/MWh	Cost of hydrogen in \$/kg
2010	360	n/a	1500	600	24
Today	30-45	0,3	950	100-140	4-5.5
+ 5 years	20-35	25	330	45-70	2-3
+ 10 years	15-27	50	270	35-55	1.5-2
Large-scale adoption	10-13	>50	170	22-28	<1

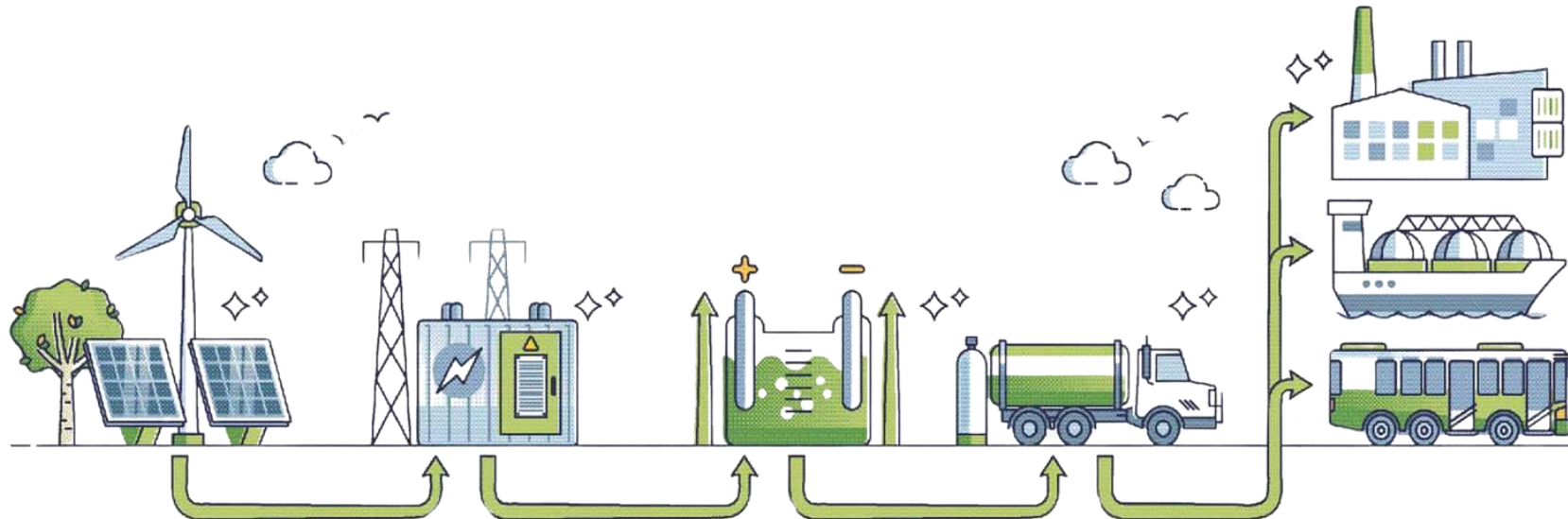
Source: The Hydrogen Revolution, Marco Alvera, 2021

7.4. Green Hydrogen Project



THE EVOLUTION OF THE HYDROGEN VALUE CHAIN

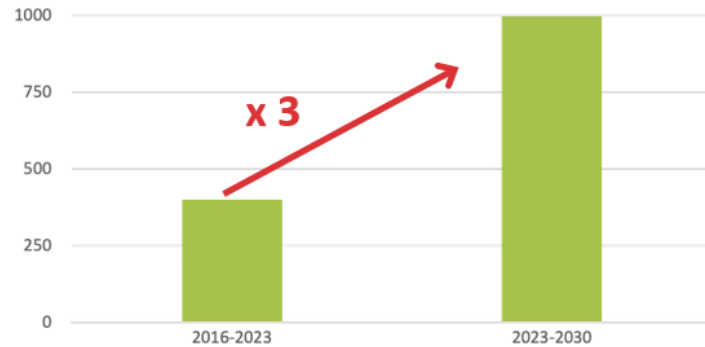
In the future, carbon-free production for multiple uses



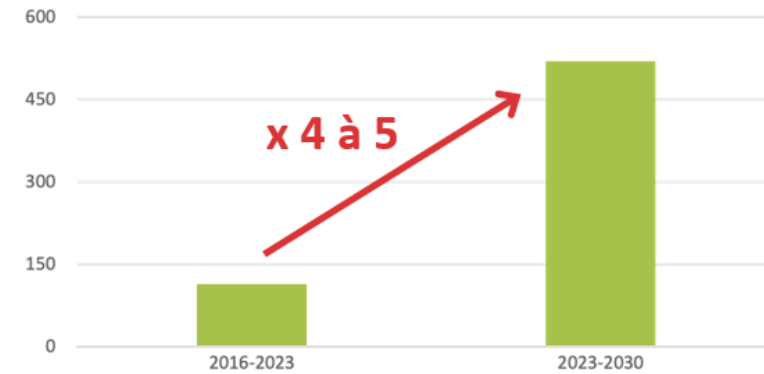
CONCLUSION

Paying tribute to men and women "They didn't know it was impossible so they did it"
Mark Twain

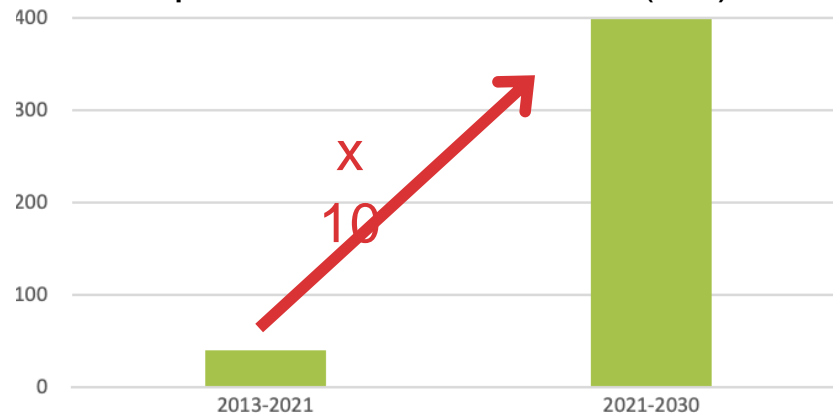
Average annual investment in power generation (\$m)



Average annual investment in T&D (\$m)



Average annual investment in mineral exploration and research (\$m)



Household waste recovery (%)

