

Water within the Circular Economy:

OCP as a leading example for Water Optimisation and Reuse

CEO Water Mandate Multi-stakeholder
Working Conference
28 August 2016



OUTLINE

- Morocco's Water Strategy
- OCP – a world leader in phosphate production
- A sustainable strategy for OCP's water
- Integrating water reuse into OCP's industrial process

Morocco's Water National Strategy

Water National Plan

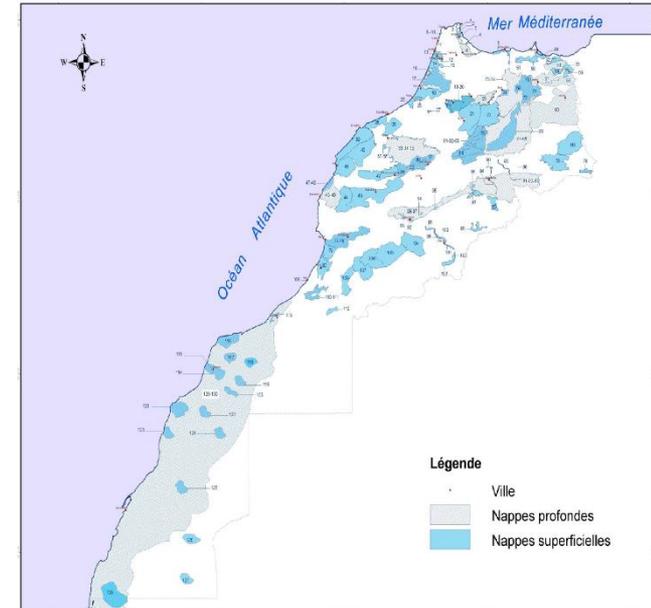
Water demand management and water valorization

Water offer development and management

Protection of water resources, natural environment and climate change adaptation

around three pillars

- Modern regulatory framework through the law 10-95
- Protection against floods
- Valorizing existing hydro-infrastructure to produce energy
- Development of irrigation
- National competences development



Overall water reserves of
22 Billion m³/year

{ 18 bn m³/yr of surface water
4 bn m³/yr of groundwater

National Plan for Water Reuse

A water national strategy to ensure sustainability

Morocco's water potential estimated at 22 billion m³ per year. With a steady increase in the water demand in the coming 15 to 20 years due to the demographic evolution and the development of the Moroccan economy.

A water strategy put in place for the mobilization of water resources for households, irrigation,... through water related infrastructures, improving the protection against floods and producing hydro-electricity.

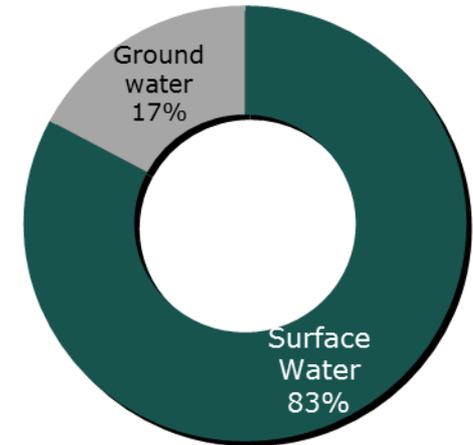


A water reuse plan

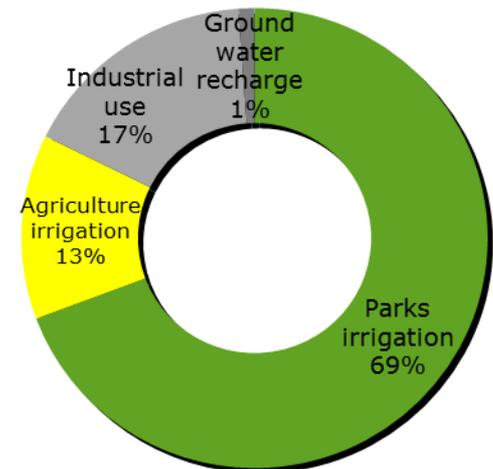
To meet these challenges, a program to mobilize non conventional water resources was put into place, through the reuse of used water with an objective of **325 Million m³ mobilized by 2030.**

Hence, this program will significantly contribute to decrease the expected deficits on certain basins. With 18 projects already in place, there are **38 million m³ per year of water reuse.**

Morocco Water Potential in m³/yr

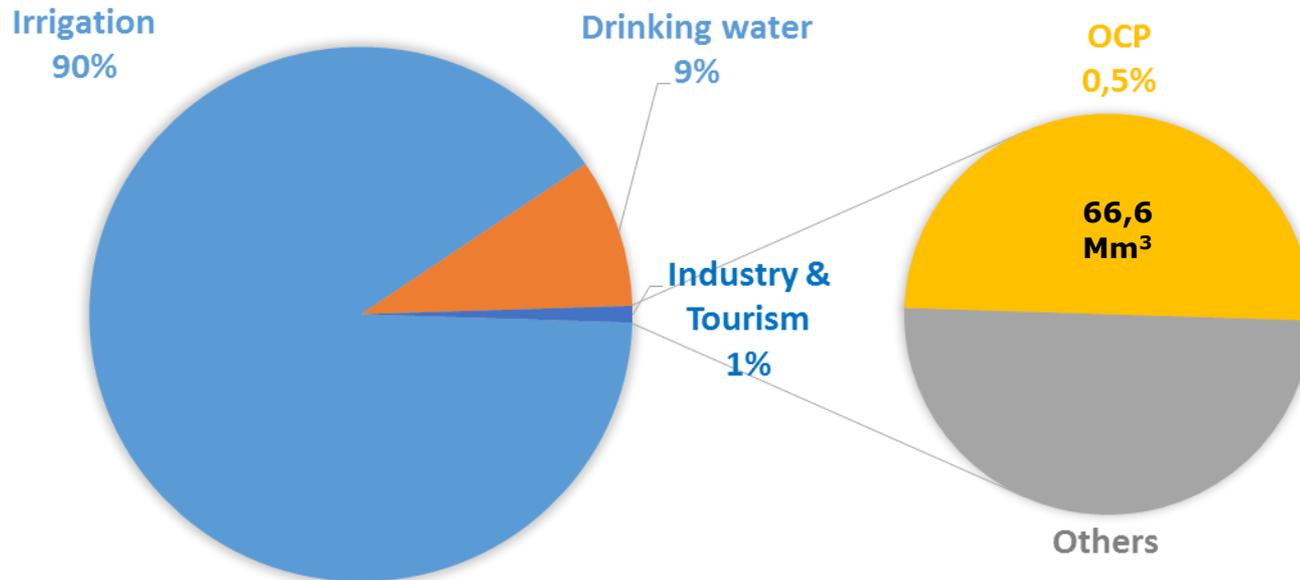


Reuse of used water in 2015



Water allocation : the industry absorbs 1% of the water

Inter-sectorial water allocation
of the 13,3 Billion m³ mobilized national water resources in 2013



The potential of naturel water ressources in Morocco is estimated on average to 22 billion m³/year, which is the **equivalence of 700 m³ per habita per year, less than 1000 m³/hab/year**, which is the threshold under which there will a water scarcity and the launch of a water crisis.

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OCP is among the largest fertilizer companies in the world and the largest P₂O₅ pure player

OCP AT A GLANCE: 2015 KEY FIGURES

71% of proven reserves worldwide*

20,7 % contribution to national exports

\$23 bn Investment (2008-2025)

27 % worldwide market share of phosphate in all forms in 2014

5 % contribution to domestic GDP

2nd

world producer of phosphate fertilizers

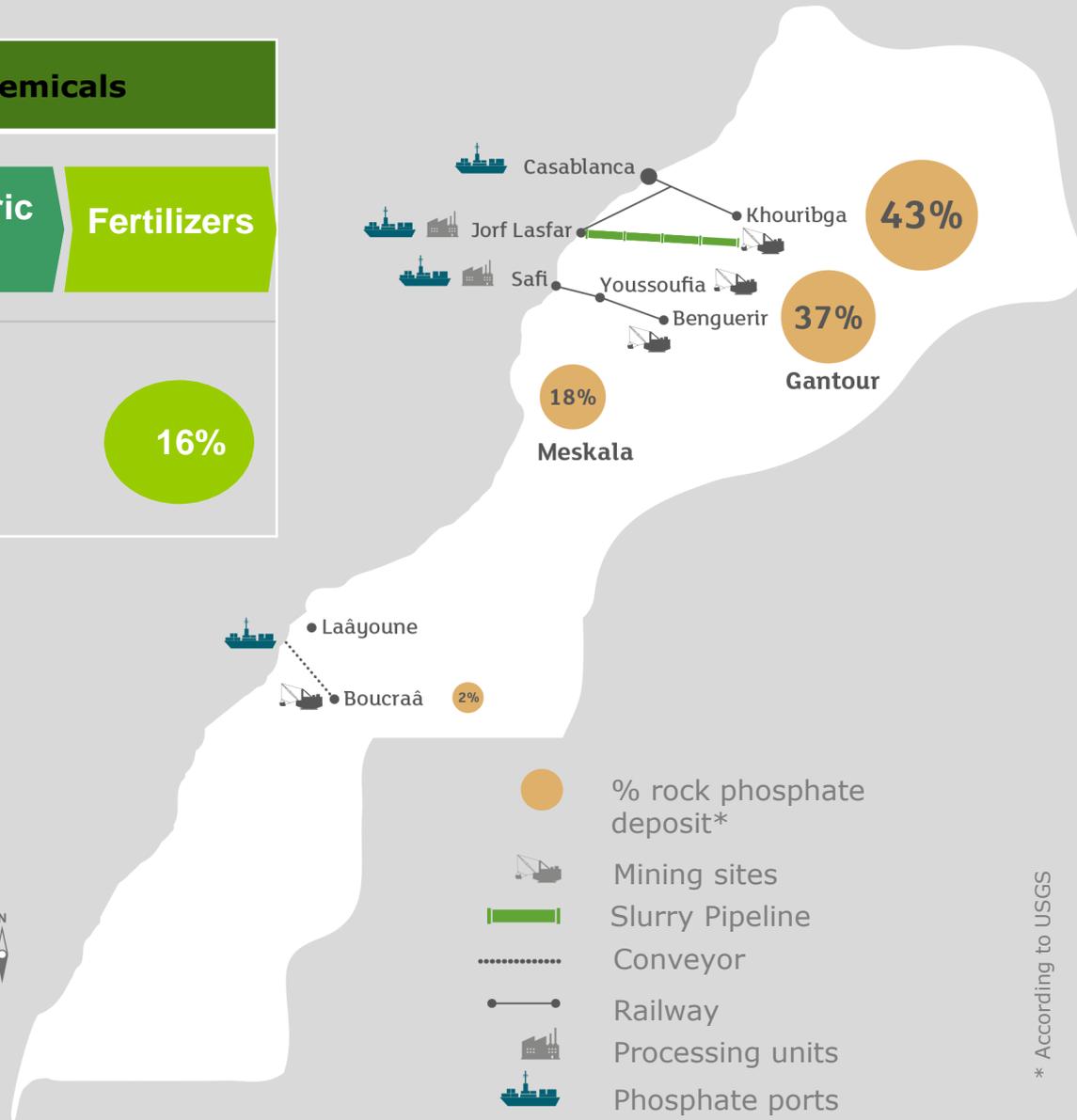
1st worldwide exporter of phosphate in all forms

\$821m of net profit

\$4,9 bn of revenue

With a unique strategic presence throughout the entire phosphate value chain

Segment	Mining	Chemicals	
Value Chain Integration	Phosphate Rock	Phosphoric acid	Fertilizers
2014 Global Trade Volumes Market Share	29%	55%	16%

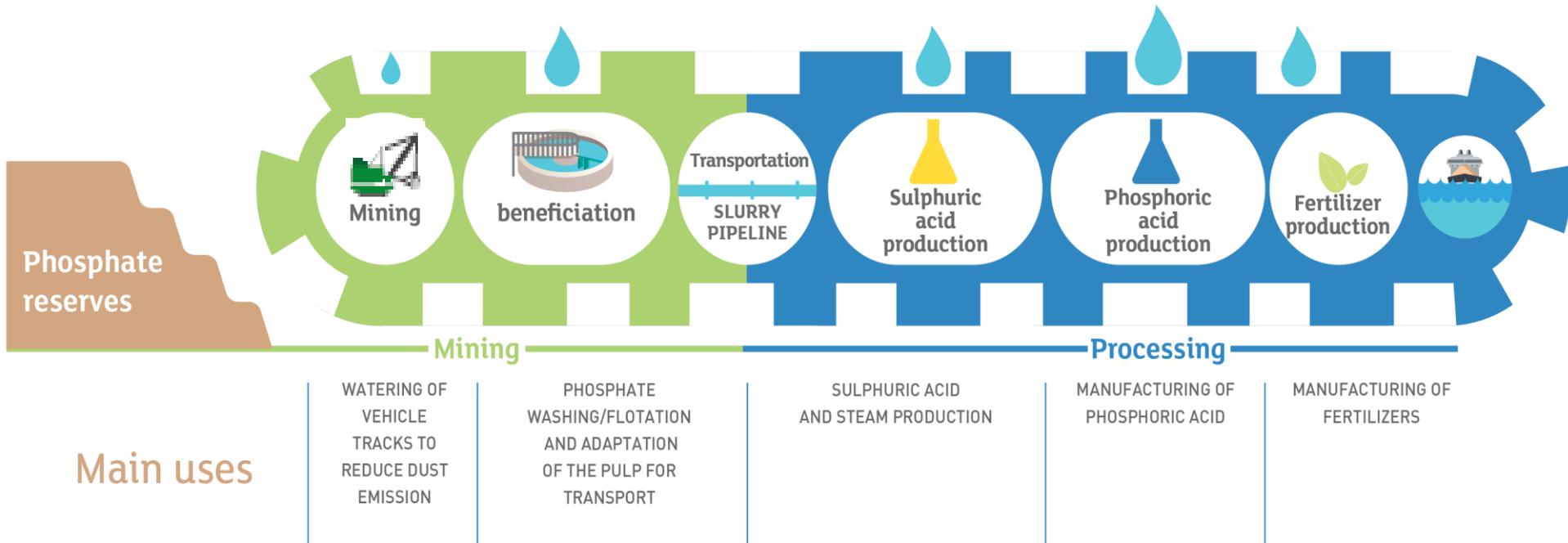


* According to USGS

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Water, A key resource of the phosphate industry



A growing water demand to carry OCP business development

The growing agriculture demand around the world is driving fertilizers production. For OCP's industrial processing, it's translated into a growing water demand, which is forecasted to grow to 160 million m³ of water per year.

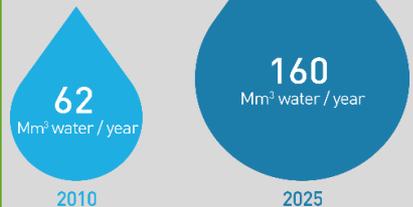
OCP INDUSTRIAL STRATEGY

CAPACITY LEADERSHIP

- Double mining capacities and triple processing capacities
- Improve the efficiency of existing assets
- Be a leader in capacity over the three phases of the value chain by 2017

x2 Mining capacity
x3 Processing capacity

+158%



COST LEADERSHIP

- Optimize extraction and production costs
- Strengthen the efficiency of the supply chain



Innovation & R&D



Sustainable development

INDUSTRIAL FLEXIBILITY AND COMMERCIAL AGILITY

- Implement flexible and adaptable industrial facilities
- Adapt the product portfolio to market needs

OCP launched an integrated and sustainable water strategy

OCP put in place a water strategy around three main axes that **combines industrial growth as well as natural resources optimization.**

THE 3 LEVERS OF OCP'S WATER STRATEGY



OPTIMAL USE OF WATER RESOURCES THROUGHOUT THE ENTIRE VALUE CHAIN (MINING, TRANSPORTATION, PROCESSING)



OPTIMAL MANAGEMENT OF FRESHWATER RESOURCES USE



MOBILIZING NON CONVENTIONAL WATER RESOURCES (TREATED WASTEWATER, DESALINISED SEAWATER)



1

Optimization of water usage over the entire value chain

In the mining facilities

Recovery of 80% of the water contained in the washing sludge thanks to the improvements of beneficiation process and sludge spreading system.



In the processing platform

Reduction of nearly 30% of specific water consumption of phosphoric acid production units through the adoption of the latest techniques for recycling process water.



In transportation

Slurry Pipeline technology is revolutionizing the transport of phosphates through the integration of the upstream and downstream parts of the value chain. This process **saves nearly 3 Mm3 of water annually** as a result of the preservation of the natural moisture of the rock



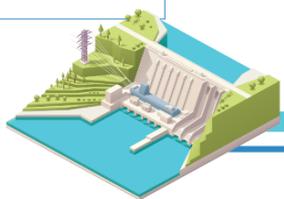
2 Optimal management of freshwater resources

- To preserve national strategic groundwater resources, groundwater consumption for industrial use is substituted by surface water.

→ ***In order to satisfy the water needs of mining facilities in Khouribga and Gantour, OCP launched the construction of two surface water supply systems from the Ait Messaoud and the Al Massira dams.***



Ait Messaoud dam



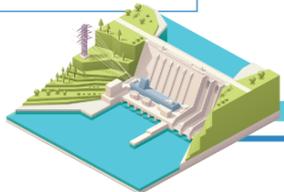
45 million m³/y

Khouribga mining facilities



Operational since the 1st trimester 2014

Al Massira dam



18 million m³/y

Gantour mining facilities



2nd semester 2016

3 Mobilization of non conventional water resources

OCP launched several initiatives to diversify water sources and to integrate new alternatives mainly wastewater treatment and reuse and desalination.

Sea water desalination

- The new reverse osmosis desalination plant built in Jorf Lasfar has, in its first phase, an annual production capacity of **25 Mm³** (an investment of US\$ 82 million)
- This freshwater technique has been used by OCP since 2005 in its Laâyoune station.

A positive impact as a result of energy optimization

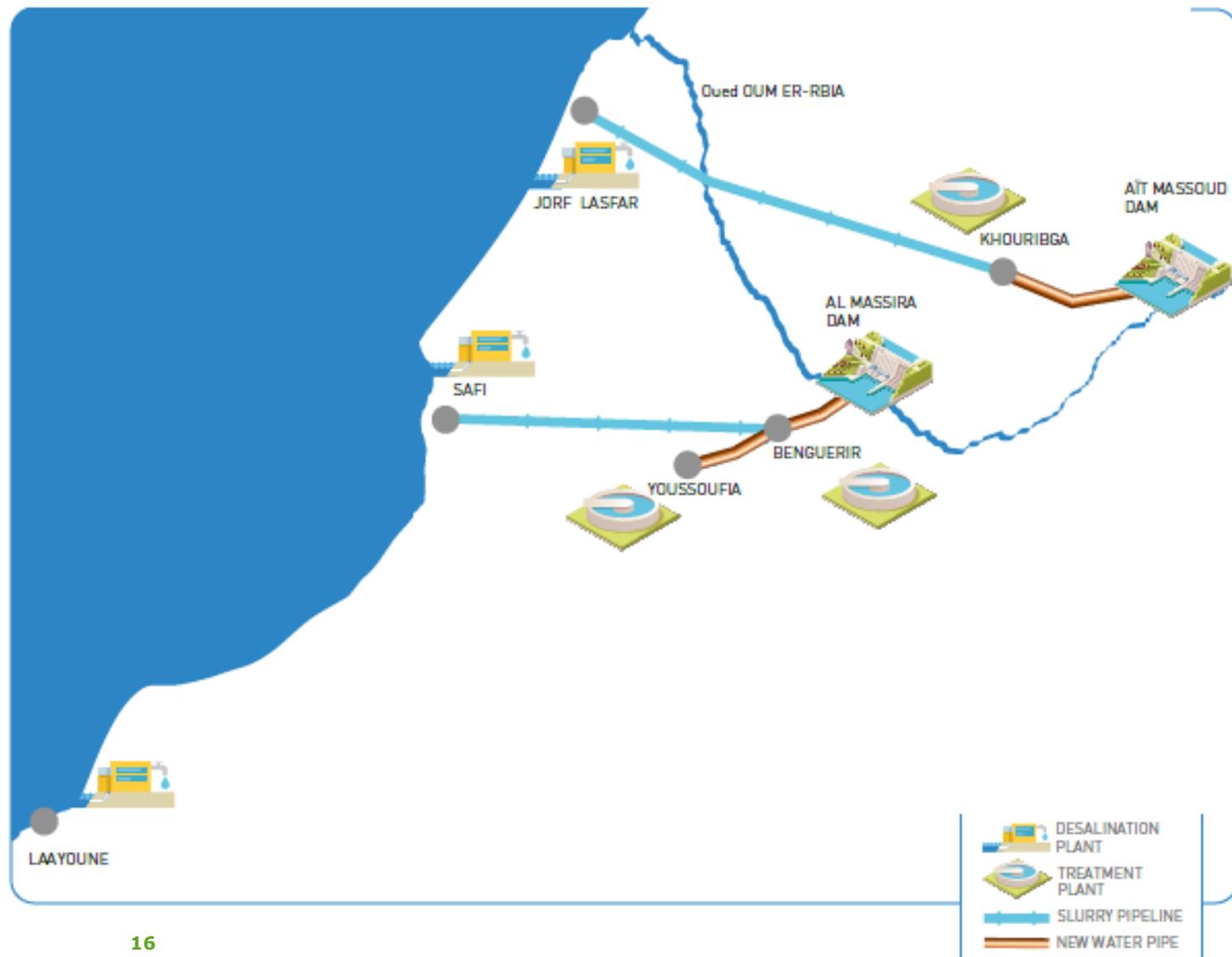
The desalination plant gets all its energy needs from the energy surplus of OCP's industrial production units.

Wastewater reuse

- Purification and reclamation of urban wastewater for phosphate washing and irrigation of green spaces...

The biogas enables an electricity production which satisfies up to 30% of the plant's energy needs.

A mix of water management techniques providing optimal solutions to water needs

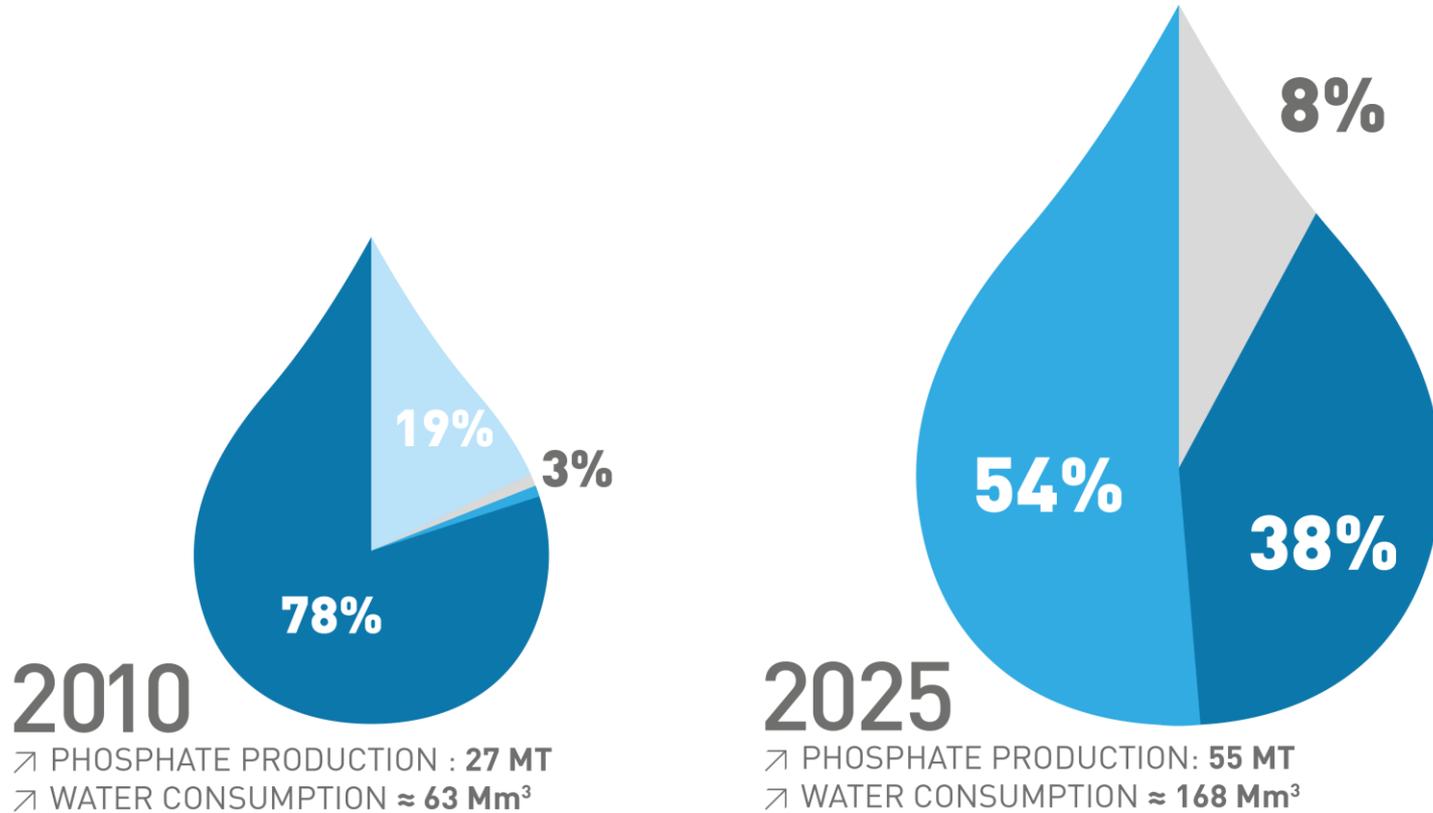


OCP keeps its national conventional water resources usage at a constant level by bringing in more than \$50 million* in new water sources.

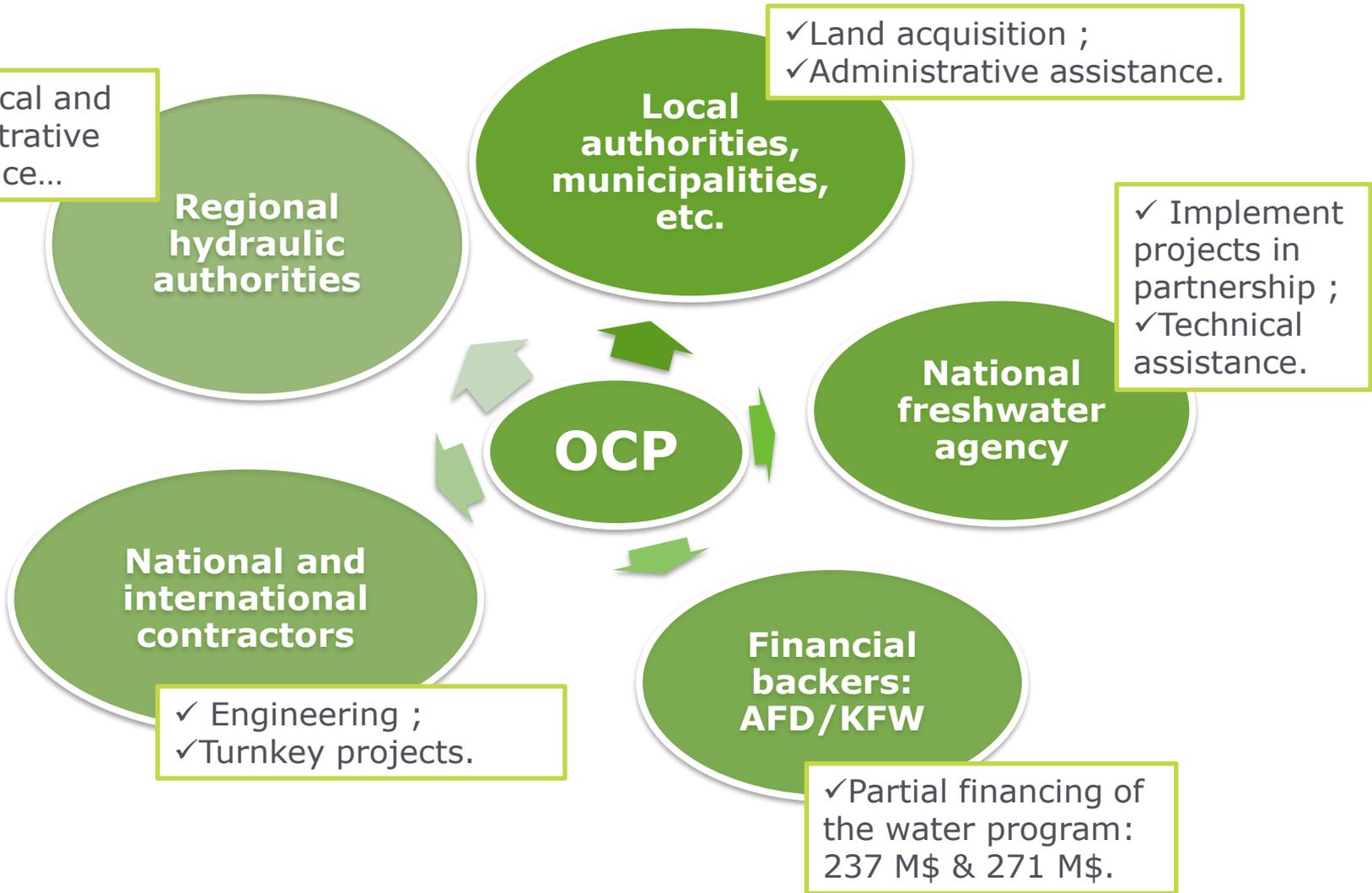
*CAPEX & OPEX over 20 years

...and a new water consumption configuration

More than 60% of the industrial water needs will be met by non-conventional resources (treated wastewater and desalinated water)



The success of the water strategy lies on the implication of all stakeholders through different partnerships



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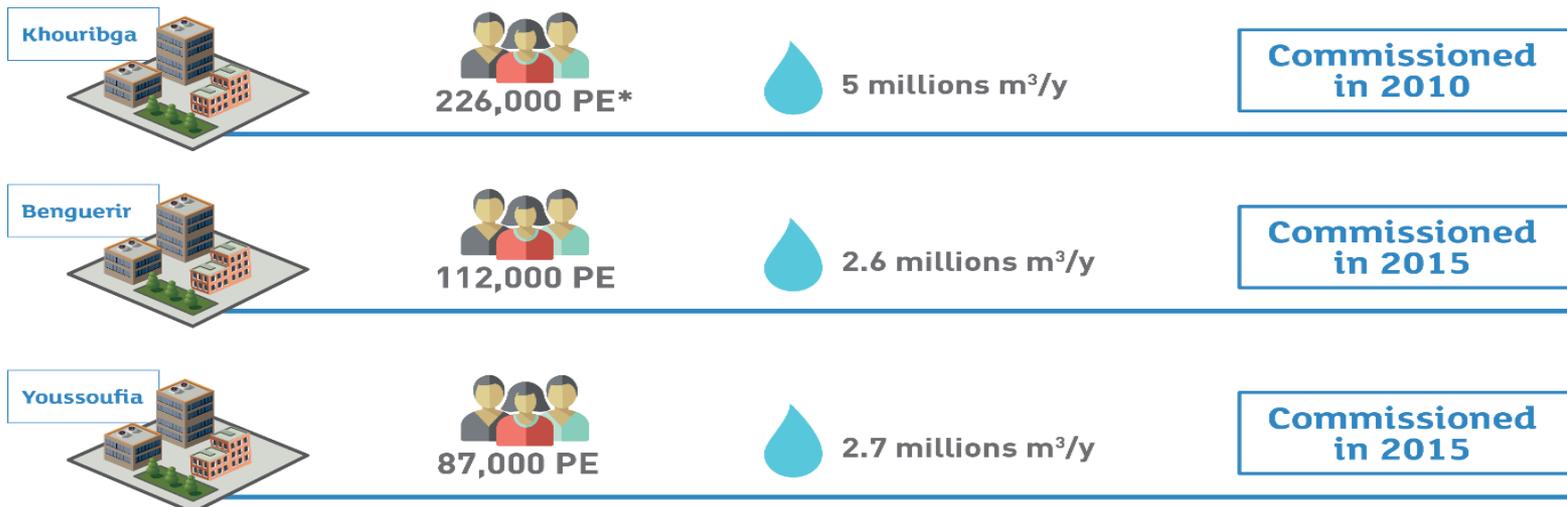
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A successful integration of wastewater reuse throughout OCP's industrial process

- Three wastewater treatment plants (WWTP) with a total capacity of **10 m³/yr** have been built in three mining cities in order to use the treated urban wastewater to wash phosphate and water green spaces in the Mohammed VI green city in Benguerir. These plants are equipped with advanced technologies to obtain very good water quality.
- In partnership with the national freshwater agency, the regional hydraulic authorities and the municipalities.
- Other WWTP projects in different Moroccan cities are under study (Kasba Tadla ($\approx 1,3$ Mm³/yr), Eljadida (≈ 7), Safi (≈ 7))



Khouribga WWTP
– the first water
reclamation program in
Africa -



*Population Equivalent

**Thanks to its partnership based approach,
OCP is able to ensure the most optimal
conservation of natural water resources, and
confirm its position in a circular economy.**

**This reflects our strong and long-term
commitment to future generations.**

www.ocpgroup.ma