

# Good practices in NMHS modernization: the case of Angola

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# SUMMARY



1. General INAMET introduction

2. INAMET Modernization Project (2019-2023)

3. Status and Future plans (2024-2030)



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# 1. INAMET

## General Introduction



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# INAMET General Introduction

## History

After independence, the meteorological service of Angola went through several ministries:

- Ministry of Transport
- Ministry of Posts and Telecommunications
- Ministry of Telecommunications, Information Technologies
- **Ministry of Telecommunications, Information Technologies and Social Communication - NOW**

# INAMET General Introduction

## Main mandates (as per INAMET statutes, 2021)

- Observation & data exchange
  - Ensure meteorological, geophysical and astronomical surveillance in Angola.
  - Plan, install and coordinate national observation networks and connect to GTS and WIGOS
  - Monitor weather and climate conditions
- Services
  - Keep continuous improvement on forecasting, through operation of regional models
  - Provide forecasting services for all activities including air and maritime navigation
  - Issue warnings in coordination with Civil Security
  - Support armed forces
  - Provide tailored services based on climatology and forecasting toward all weather and climate sensitive sectors
  - Develop R&D activities and capacity building

# INAMET General Introduction

## Strategic Planning

- PDE (Strategic Development Plan)
  - 7 years
  - Endorsed by President of Angola
- Yearly updates (PDN)

## Strategic partnership

- INAMET – Meteo France International
- Implementation of PDE (Phase 1): started in 2019

## 2. INAMET Modernization Project (2019-2023)



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# High-level objectives of the project

- Create a **reference public actor** in Angola in the field of weather and climate
- Implement PDE strategic goals through a **PPE-DBO approach (Design Build Operate)**
  - ➔ Strengthening of the **national observation network**
  - ➔ Implementation of a modern and **integrated information system** allowing optimized forecasting, adequate early warning, climate monitoring and overall global enhancement of service capacity
  - ➔ **Transfer of knowledge to NMHS's staff**

Strategic Partnership agreement with MFI  
(Meteo France International)

- Better protection of people & goods
- Efficient support to the economy
- Contribution to the implementation of the Paris Agreement on Climate

# ID and key figures of the Project

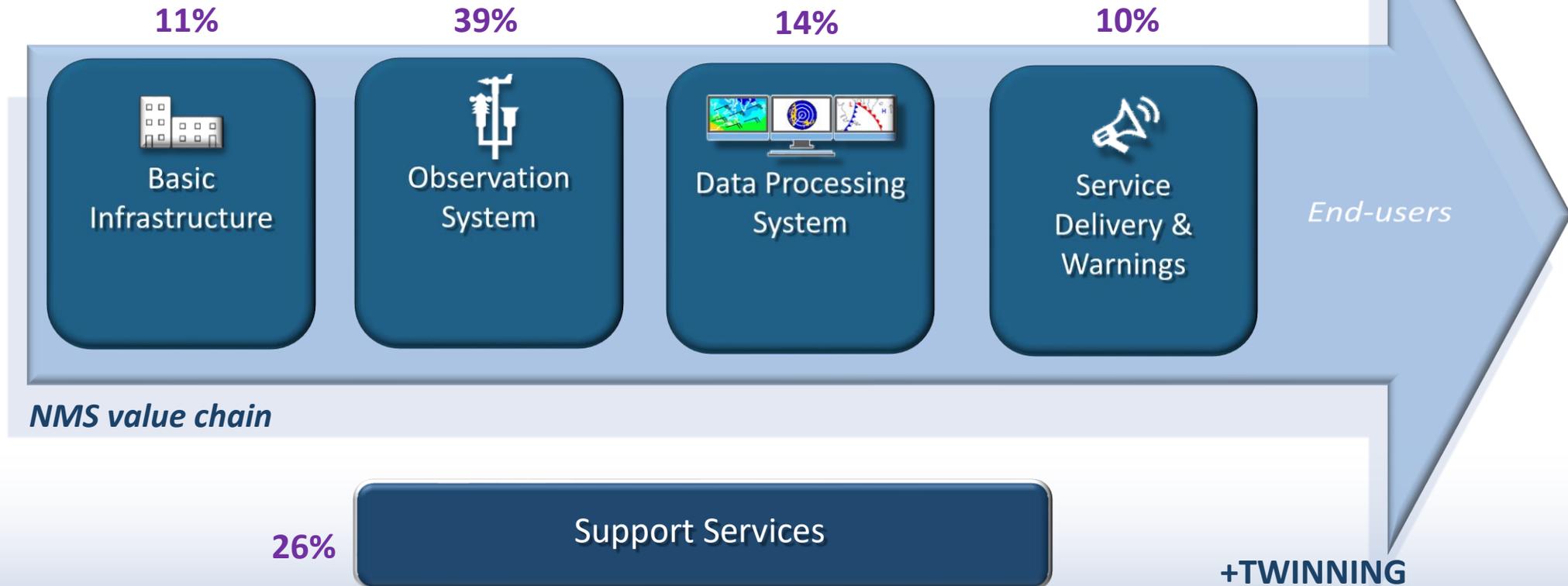
- Main beneficiary : **INAMET** (Angola NMHS)
- Financing solution: Société Générale buyer credit
- Functional scope : Implementation of the full MET Value Chain
  - Meteorology (96%): Marine, atmosphere, aviation + applications (agro, oil & gas)
  - Hydrology (3,5%) & Seismology (0,5%)
- Main Stakeholders :
  - Ministry of Agriculture
  - Ministry of Environment (Water resources agency (INRH) + GAMEK)
  - Ministry of Transport (ENNA/SGA/INAVIC/ANAC: civil aviation and airports)
  - Civil Security & Oil & gas sector agencies

## KEY FIGURES

- 
- 60 million €
  - 36 Project's Lots
  - > 10000 working days
  - > 50 different types of training
  - 83 observation sites modernized/created

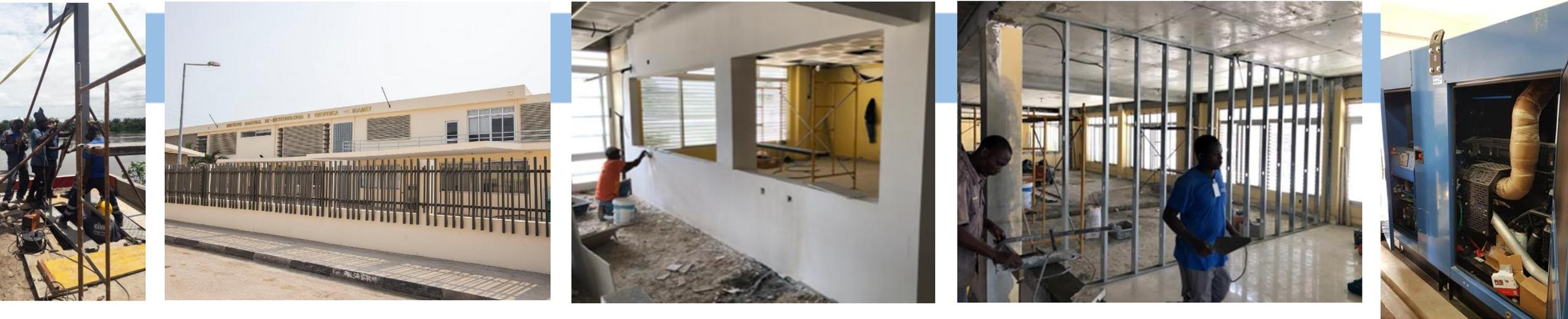
# Project designed across the full Value Chain

## ANGOLA Project: 36 subprojects



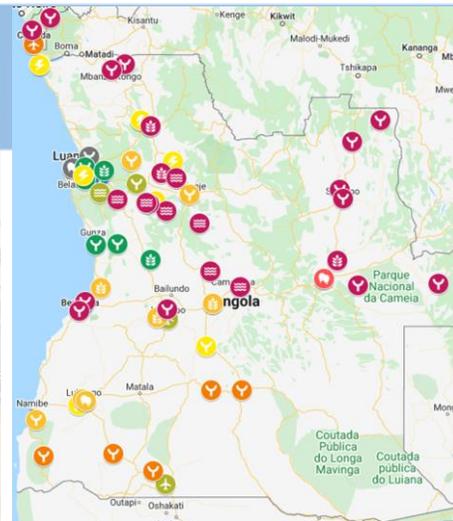
+TWINNING





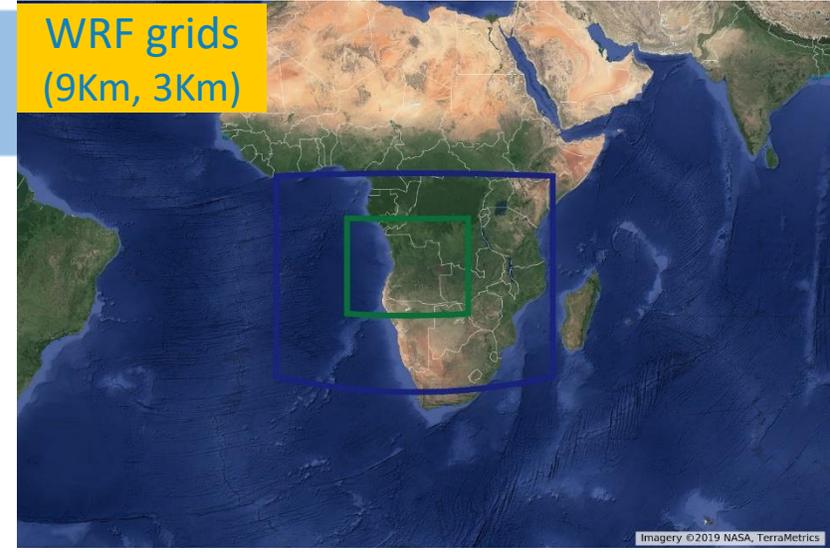
## INFRASTRUCTURE: CNPT building, generators, specific works





OBSERVATION: 83 sites (Synop + Meso + Hydro + Lightning AWOS + upper air, etc)





# INFORMATION SYSTEM (telecom, data proc, HPC-models, forecasting, EWS-PWS)

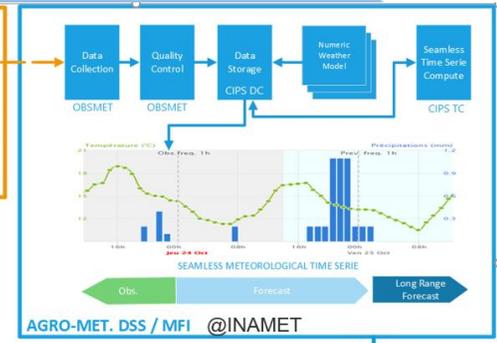


# Oil&Gas



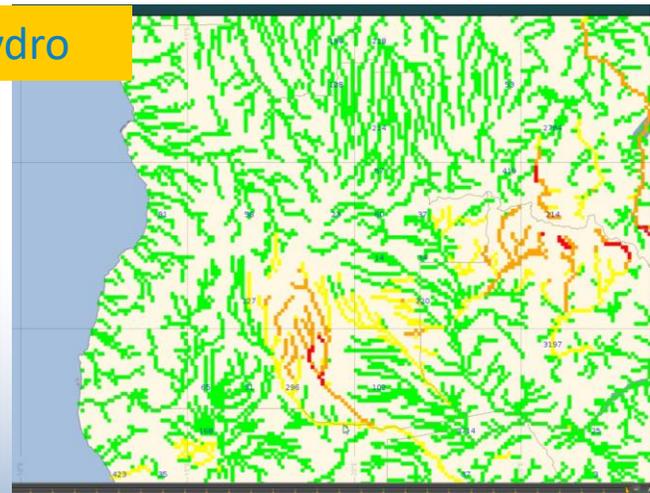
Forecast Summary													Warning					
Forecast: MacDuff. The situation is currently convective and will decrease during the second part of the day. Sea current from 155° @ 1kt and 220 @ 0.3 kt this night.													Risk of Gale up to 26h			Maximum of Risks strongly becoming weak		
Mon 23				Tue 24				Wed 25										
UTC Hour	06	09	12	15	18	21	06	09	12	15	18	21	06	09	12	15	18	21
Dir	SE	E	COG	SWW	COE	E	SW	SWW	SW	SE	SE	SW	SWW	SW	SE	SE	SWW	SW
Wind	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wave	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Temp (°C)	27	25	26	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Cloud	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁	☁
Wind-dir Speed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wave-dir Speed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wave-dir Dir																		

# Agro



# Website

# Hydro



# TV

# Mobile App.

# Lessons learnt

- **Power of the integrated approach (DBO)**

- Project would not be feasible otherwise
- Many improvements brought to INAMET in a short time despite Covid
- **Simple organization: one partner only** to monitor the implementation and ensure consistency between project's components across the value chain
- **Simplified administrative processes** related to the procurement of equipment and services
- **Flexibility all along the project lifetime** (scope, schedule, training, etc): easy to make adjustments to adapt to local context or changes
- **Better integration of all components** all across the value chain, and ultimately a higher effectiveness of the investment
- **Continuous improvement** based on INAMET feed-back
- **Sustainability** thanks to assistance to operations on the integrated chain (Infra, Observation, IT, etc)

- **Remaining challenges**

- **Lack of qualified human resources** vs target organization to maximize value for Angola → joint work with Ministries to appoint new staff
- **INAMET switch to user orientation** not yet finalized (change management)

# 3. INAMET future plans (2024-2030)



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# INAMET future plan: PDE Phase 2

**This project is expected to start in 2024** on the foundations of Phase 1.

- **Observation (>100 new stations)**
  - Densification of Synop, Meso, upper air, seismology networks
  - New networks: marine stations, raingauges, wave radars
- **Information System**
  - Upgrade of INAMET capacity (hardware, HPC, software)
  - Set-up of an ensemble forecast modelling system
  - Introduction of Impact Based Forecast and contribution to Warning for All
- **Application projects for increased Socio Economic Benefits**
  - For Min. of Agriculture, Health, Energy, Civil Security, Luanda Megacity, Armed Forces, Oil& Gas
- **Capacity Building**
  - Initial training, MSc, PhD
- **Long-term Assistance to Operation**
  - On Phase 1 + Phase 2 deliverables

# Conclusion

## Modernization is a long-term journey

- INAMET is lucky to have a validated PDE (Strategic Development Plan)
- INAMET appreciates the concept of **long term partnership** on a full integrated approach
- Change management is key and requires energy and leadership from the management



Thank you !

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