LOGIC ENERGY

Energy Planning in Egypt

Roundtable Discussion: Future of Energy in Egypt

14th May 2014

“By failing to prepare, we are preparing to fail”

- Benjamin Franklin

Key questions

1. How can planning support our current challenges?
2. How should planning evolve with market evolution?
3. How should our energy planning system function?
4. How does our energy planning system really function?
5. What should we do?

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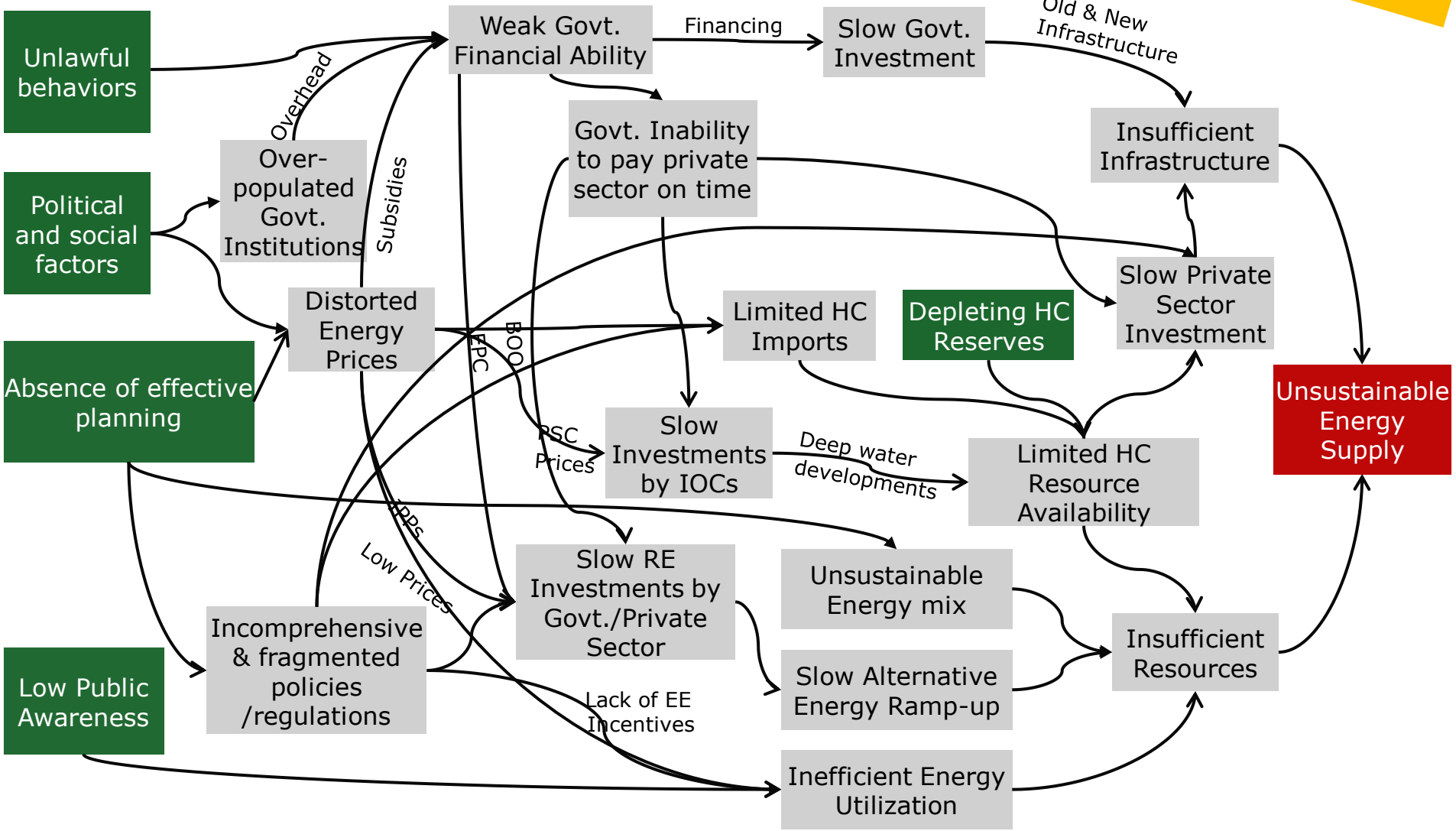
Currently the Egyptian energy sector is facing critical challenges that are impacting the whole system

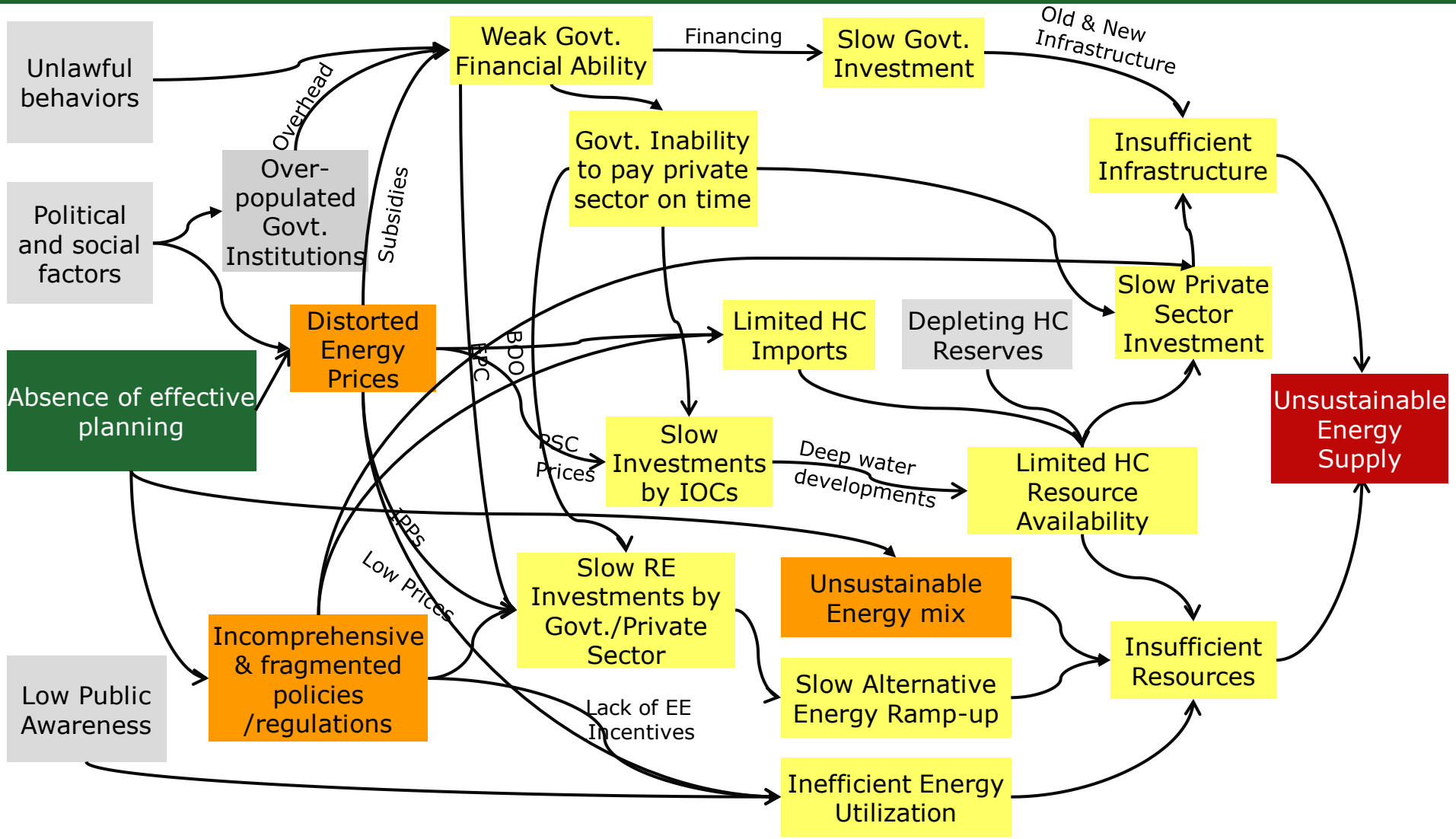
Non-Exhaustive



Source: Research, interviews & LOGIC Energy Analysis

Note: This is not a comprehensive list of challenges, rather one that shows the impact of planning on current challenges

Absence of effective central planning directly impacts most causes of "Unsustainable Energy Supply"



Source: Desk Research, interviews a& LOGIC Energy Analysis Note: This is not a comprehensive list, but rather one that shows the planning impact

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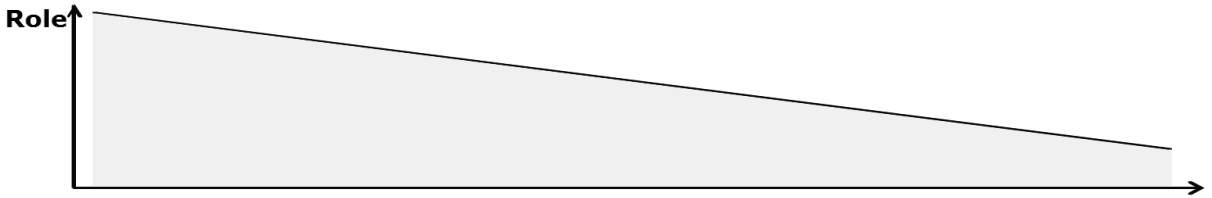
The role of planning changes as the market evolves from a monopolistic to free market*

Monopolistic Market → Free Market

Planning



Planning is critical because government is responsible for meeting demand. Long and short term plans are needed to ensure coordination of the different execution units

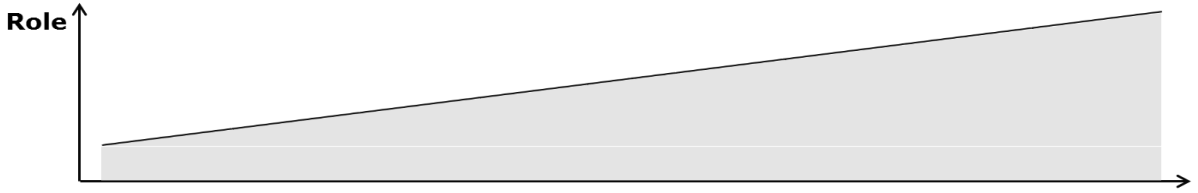
Central Planning role is limited on the government's side because execution is open to private sector . Only long term strategies and policies are needed to guide the market

Execution

Execution is monopolized by the government. It is the sole market player and all the executing authorities and companies are controlled by it

The market is open to both government owned and private sector players to invest and operate in the energy market

Regulation



Regulation role is limited as government is regulating its own utility which has a natural monopoly

Regulation role is critical to protect consumers and investors rights by imposing rules that regulates the use of the energy networks and supports the government strategy

Source: LOGIC Energy Analysis

*Currently, Egypt is considered at an early stage of moving towards free market

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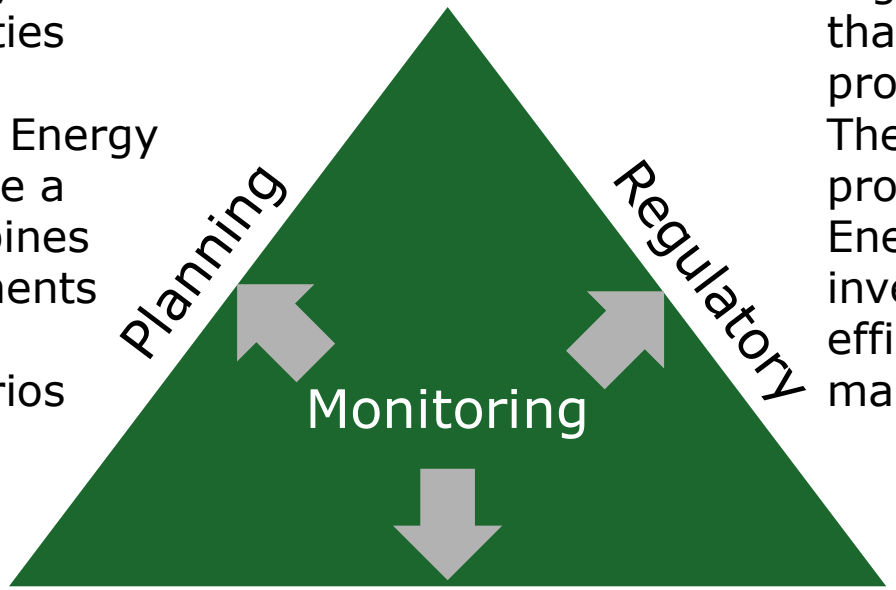
Planning is one arm of the Energy Governance System

It is the process of identifying strategies, policies and/or activities required to meet an expected demand on Energy products or to achieve a desired goal. It combines forecasting developments with preparation for corresponding scenarios



It is the group of activities, regulations or conditions, that govern particular procedure or behavior. These take place to ensure protecting the rights of Energy consumers and investors, and to promote efficiency in the Energy markets

Execution

The carrying out of activities that take place to fulfill a task to its completion, that being sufficing demand on Energy products through up-stream, mid-stream, and/or down stream activities

Source: Literature Review & LOGIC Energy Analysis

There are two levels of planning; national level and energy carrier level

	National Level Planning			Energy Carrier Level (Utility level) Planning	
Definition & Objectives	• High Level strategic planning that reflects national long-term energy objectives • It covers the overall spectrum of energy sources, users and transformation • Comes out in a form of a strategy, policy or Plan • Long-Term (>15 years)			• Achieves the objectives indicated in the national level plans • It is the planning done to optimize the sourcing structure of a certain energy carrier in order to meet the required demand • Carrier level planning can be short, medium or long (1-15 years)	
Output Forms	Integrated/ Joint National Energy Strategy	Integrated Energy Policy	Integrated Energy Plan	Integrated Resource Plan	Operational Plan

Source: LOGIC Energy Analysis

The national level has three output forms, namely; 1) Integrated Energy strategy which is commonly used

Integrated Energy Strategy

Definition

- The Integrated Energy Strategy defines the main objectives of the energy sector and sets strategic initiatives to achieve national targets
- This includes the strategies of both the electricity and the petroleum sectors
- Time Bound > 15 years

Output

- Strategic objectives (e.g. Diversified fuel supply)
- Strategic initiatives (e.g. Integration with European electricity and gas networks)

Countries *

Components

- Identify National Energy Objectives
- Demand Forecast
- Current Resource Assessment
- Future Energy Mix Scenarios (Including Energy Efficiency potential)
- Social and Environment Impact Study
- Identify strategic Initiatives
- Identify sectorial goals

Source: Literature Review & LOGIC Energy Analysis * Non-exhaustive list of countries

2) Integrated Energy Policy which is adopted by some countries

	Integrated Energy Policy
Definition	• It is based on either a strategy or energy objectives. It assesses major energy trends and challenges facing the energy sector and provides policy recommendations to achieve the strategic objectives. These policies act as a guide for the activities of the different energy domains • Not time bound; reviewed every year/2 years
Output	• A set of policy recommendations (e.g. adopt triennial building standards updates)
Countries *	 

Components
Current Resource Assessment
Demand Forecast
Assessment of system reliability and the need for resource additions
Energy Efficiency potential assessment
Social and Environment impact Study
Examination of the success of introduction of different policies
General and Sectorial Policy Recommendations

Source: Literature Research

* Non-exhaustive list of countries

3) The Integrated Energy Plan which has not been proved as a successful methodology

	Integrated Energy Plan
Definition	• The Integrated Energy Plan is a **complete integrated long term action plan** that defines the best way to meet current and future energy service needs in the most efficient and socially beneficial manner • Time Bound > 15 years
Output	• Long term integrated action plan
Countries	 (Not finalized)

Components
Identify Objectives
Demand Forecasts
Developing energy models
Running Test Cases through the energy optimization models
Update the integrated resource plans for Electricity, NG* and LF**
Analyze and suggest Policy Recommendations

Source: Department of Energy-SA & LOGIC Energy Analysis

*Natural Gas - **Liquid Fuel

The Energy-Carrier Level Planning has two output forms, namely; 1) Integrated Resource Plan,…

Integrated Resource Planning

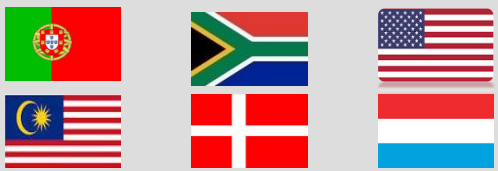
Definition

- It is a planning process that helps utilities to assess supply resources and satisfy forecasted demand for carrier services (Electricity, Natural Gas, Liquid Fuel) through a **cost efficient combination of supply** and **end-use efficiency measures**
- Developed for certain Energy Carrier (Electricity in most cases), so it is to be adopted by utilities
- Not integrated in free markets
- Time Bound 10 → 20 years

Output

- Optimum Energy Mix
- Pricing Structure
- Action plan for investments and infrastructure
- NEEAP & NREAP

Countries



Components

- Identify Goals
- Demand Forecast
- Current Resources Assessment
- Optimum Resource Mix (DSM, Supply, T&D*, Prices)
- Social and Environment impact study
- Uncertainty Analysis
- Public Hearings and Approval by Regulator
- Prepare action plans to implement

Sources: IEI 2011, Dr A Kaupp, & LOGIC Energy Analysis Infrastructure

* T&D: Transmission, Distribution and

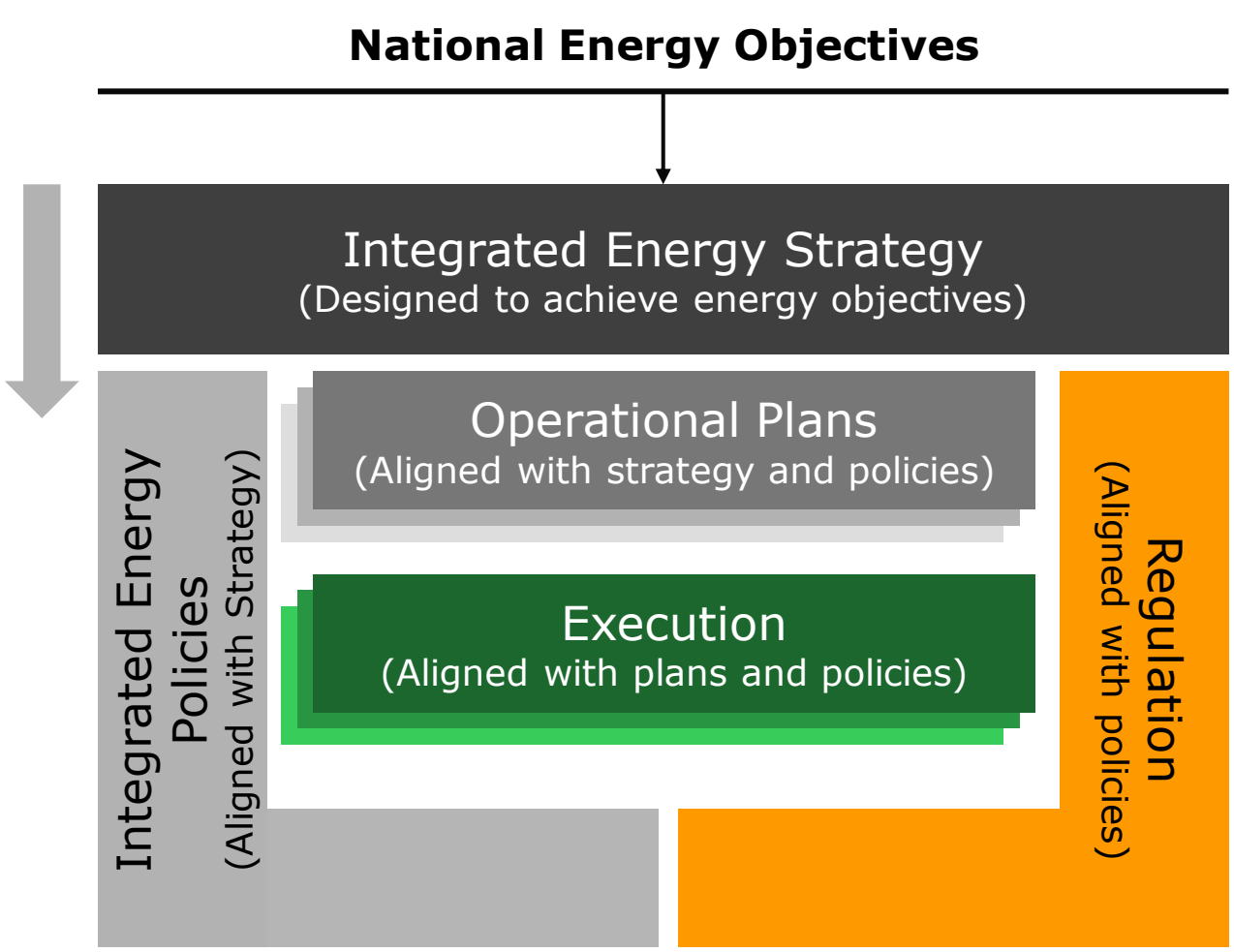
2) Operational Plans which lists the activities and investments needed to execute the plans

	Operational Planning
Definition	• Operation Planning defines projects, activities and investments required to deliver the energy service needs to the customers in the energy sector • It requires a National Strategy • Time Bound < 5 years
Output	• Specific actions plans • Short term targets to be achieved
Countries	Most Countries

Components
Sectorial Targets (From strategy or IRPs)
Activities
Investments
Costs
Milestones
Detailed Action Plan

Source: LOGIC Energy Analysis

Those output forms are harmonized with execution and regulation to form an effective EGS*in transforming markets



- National energy objectives are clear and precise (e.g. Energy Security, sustainable development, Environment, …etc)
- Integrated Energy strategy to cover all energy sectors
- Integrated policies are designed to support the strategy
- Operation plans are done by utilities and are aligned with the strategy
- Execution is done according to the agreed plans
- Regulatory ensures policies are strictly followed- could be one or systematic alignment

Source: LOGIC Energy Analysis

*EGS: Energy Governance System

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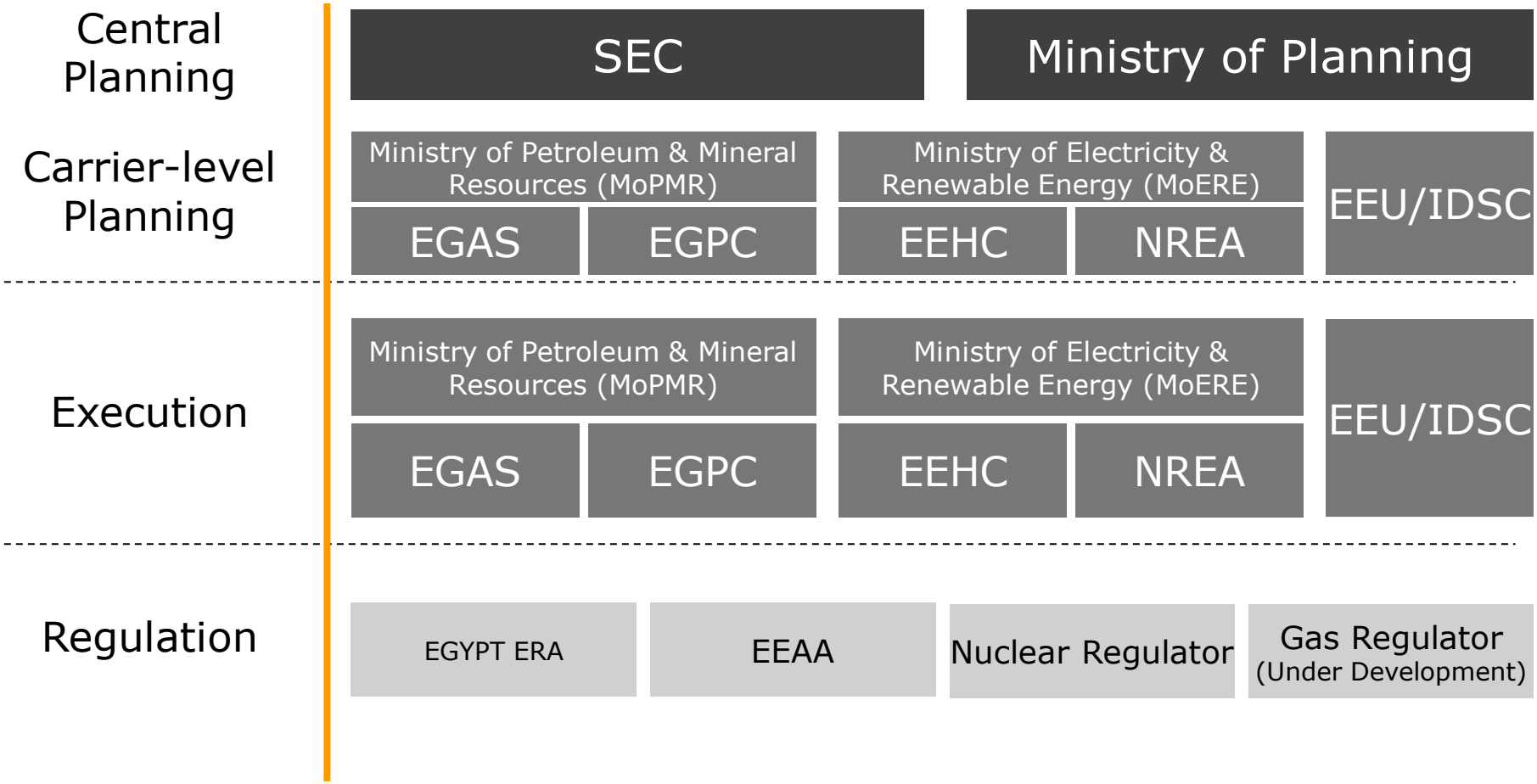
Currently, Egypt has an established energy system



Note: Positions of the boxes do NOT represent any superiority or relationships between the entities

Source: Research based on the mandates of the mentioned entities

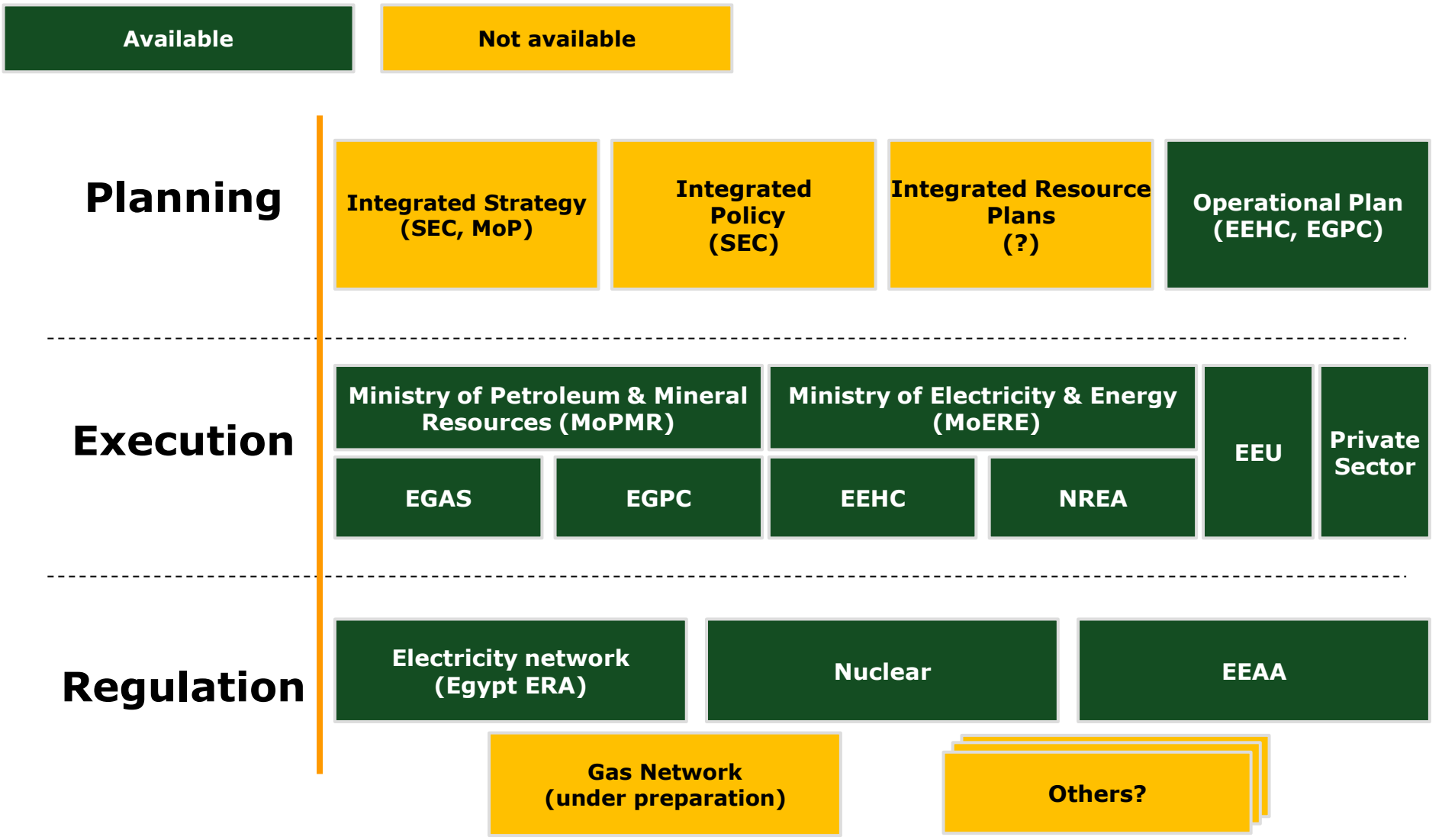
Egypt also has a legislation that defines the national planning process that is not strictly followed

Process Step	Entity
Define general strategic framework	MoP/ Cabinet/ PA*
Communicate it to Ministries and send templates	MoP
Send initial plans to MoP	Ministries
Analyze and negotiate plan modification (technical and financial)	MoP, MoF
Grant Approval for plan	People's Assembly

Sources: Law 70/ 1973 – Interview with MOP staff

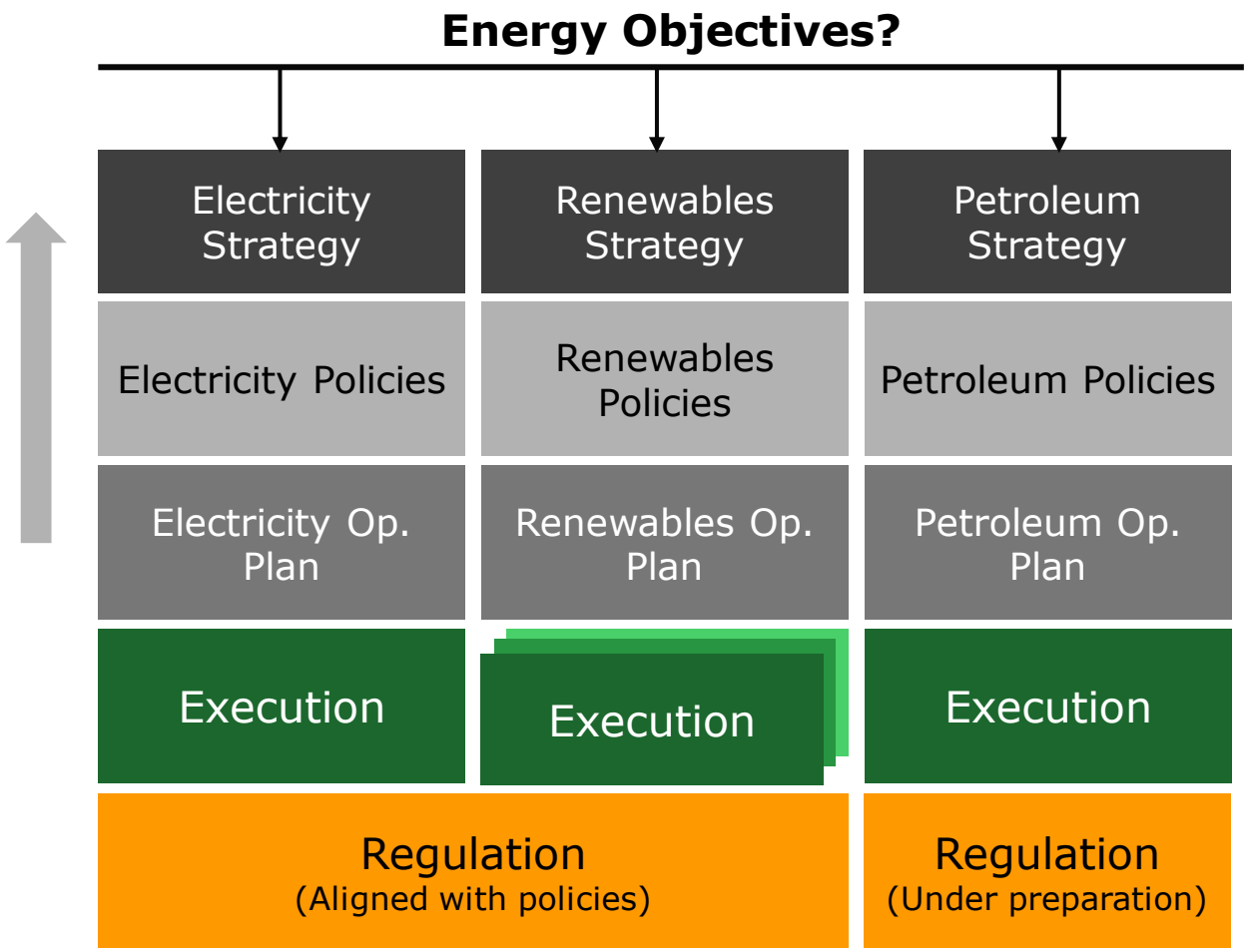
*PA: Public Assembly

The Energy System in Egypt is busy with many players, however, some key components are missing



Sources: LOGIC Energy Analysis - Based on the Legal Mandate of the aforementioned entities

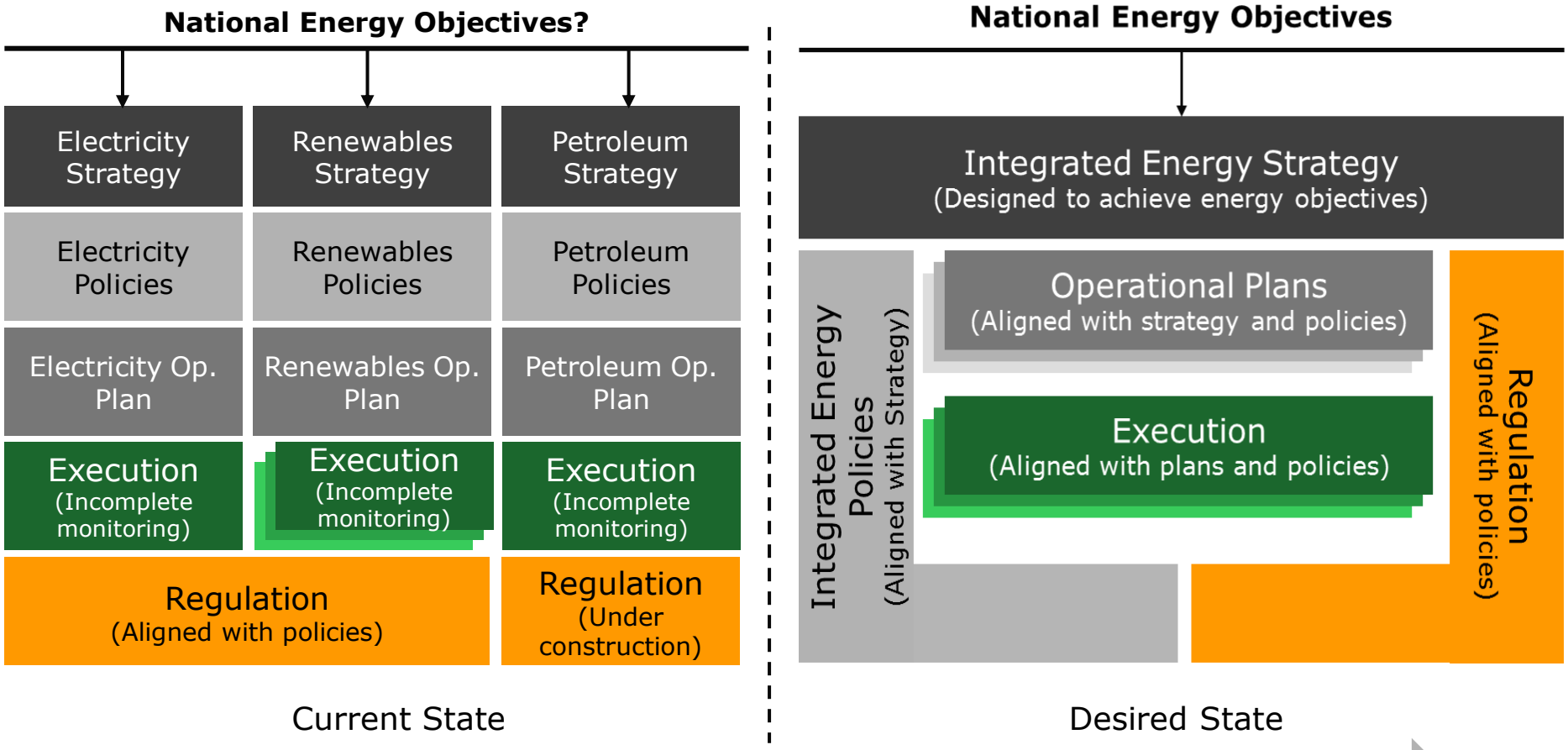
Yet, the lack of an approved integrated energy strategy leads to partially disconnected plans and ineffective execution



- No clear long-term energy objectives
- Incomplete strategies are developed by ministries and execution authorities
- No indication of alignment between strategies
- No integrated set of energy policies
- No Integrated Resource Plans
- Operational plans do not include all components and are not aligned leading to deviations (e.g. capacity ramp up vs gas + LF supply)
- Planning is done in a bottom-up approach only (sourced from execution entities)
- Regulation does not cover all energy sectors and currently has a limited power over execution entities
- Formal relationships between different entities are not clearly spelled out

Source: Interviews with key stakeholders and LOGIC Energy Analysis

Thus, the energy governance system needs to change to reach the desired state



- Integrate the energy strategies
- Integrate Energy policies
- Align policies with strategy
- Align Plans with strategies and policies
- Align execution with plans
- Integrate regulation activities
- Complete monitoring activities

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Proposed roadmap

- **Create a strong central planning entity**
  - Clear and focused governing ‘Energy Planning Law’
  - Clear implementation regulations for that Law (لائحة تنفيذية)
  - Effective and efficient organization structure
  - Strong accountable board and leadership team
  - Clear and regularly updated implementation plan
  - Focused and adopted performance management system by all the industry

- **Align all stakeholders on its role**
  - Updated planning processes in all energy institutions
  - Transparent and efficient data/information collection and dissemination