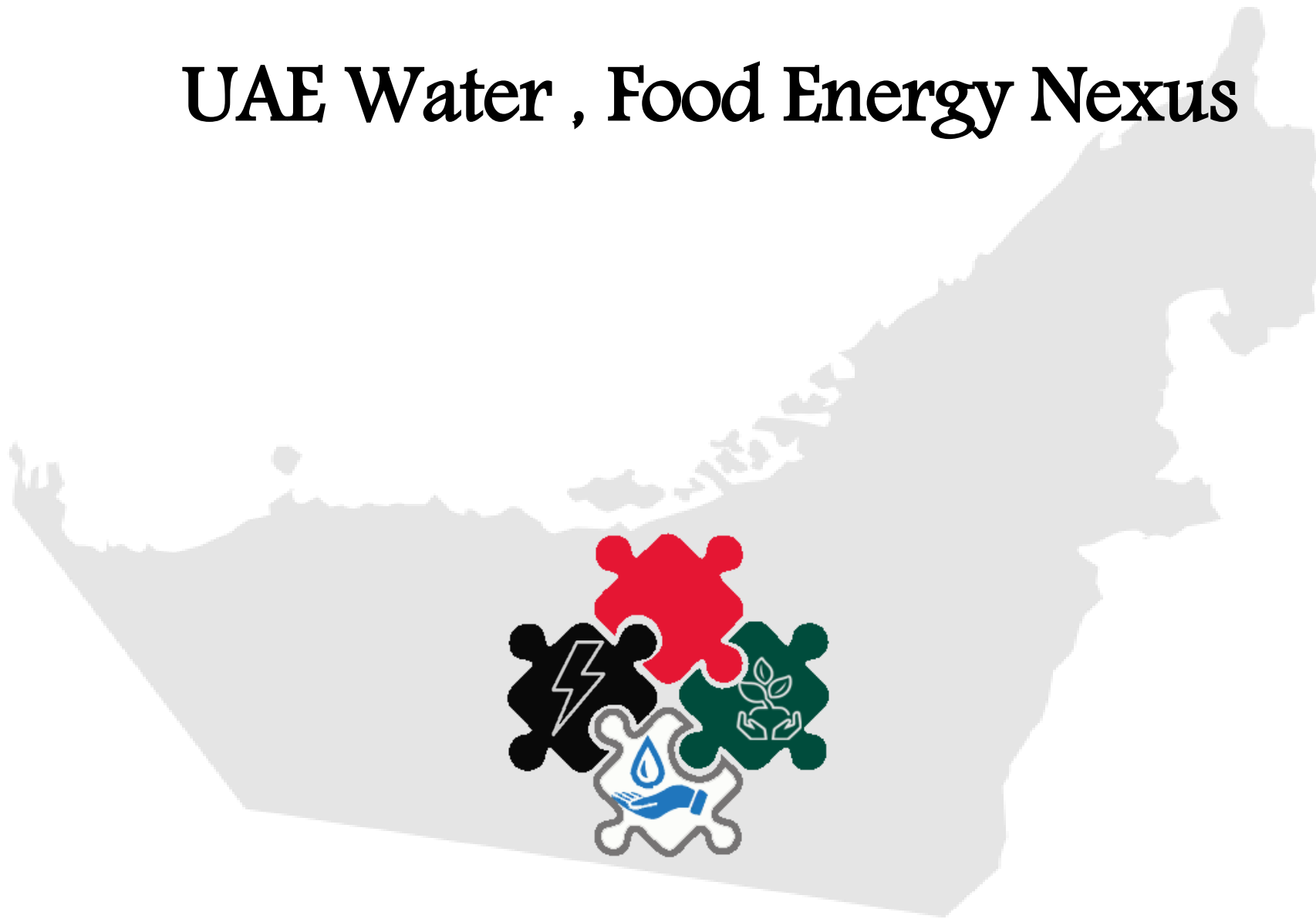


# UAE Water , Food Energy Nexus



Bridging the gap of Public Policy Development through private sector WEF Nexus innovations

**Monday, 10 Aug. 2020**



# Water, Food and Energy Nexus

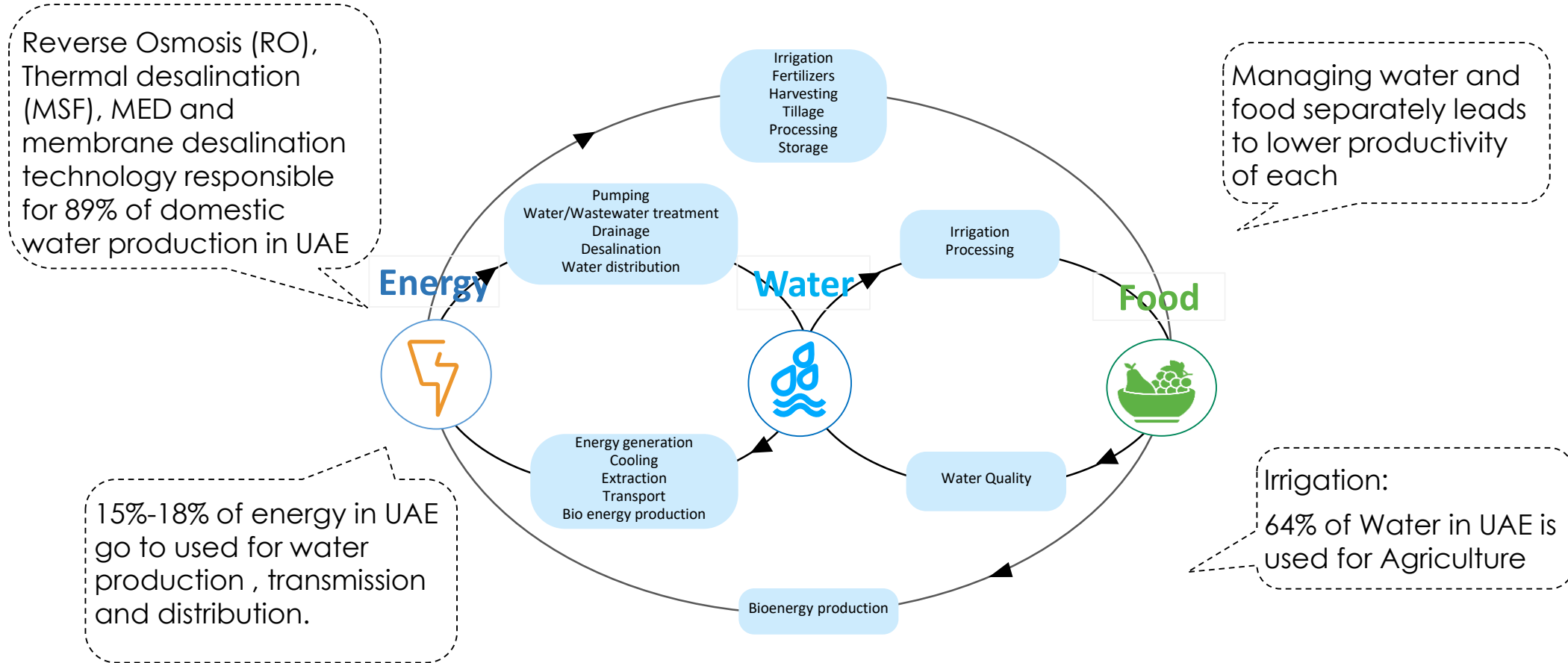
The water-food-energy nexus is central to sustainable development. Demand for all three is increasing, driven by a rising global population, rapid urbanization, changing diets and economic growth.

Agriculture (including irrigation, livestock and aquaculture) is by far the largest water consumer, accounting for 70% of annual water withdrawals globally. Industry (including power generation) accounts for 18% and domestic (households) for 12%.

We use energy to produce a fresh water. Such as using a reverse osmosis technology.



# In UAE alignment of Water , Food and energy Nexus approach is vital





# To ensure Water Security and Energy Security objectives are met,

## Federal level strategies and visions

### Agenda 2030 and the SDGs



**The UN Agenda 2030 for Sustainable Development is the central UN action plan :**

- embeds 17 sustainable Development Goals (SDGs)
- 169 targets that are critical for humanity and the planet.



### Centennial Plan 2071



**Launched in 2017, the Centennial Plan 2071 is a long-term plan, extending 5 decades post 2021.**

- It aims to establish the UAE as the best country in the world, by focusing primarily on investing in UAE youth
- addressing the issues of future generations



### UAE Vision 2021



**Launched in 2010, the UAE Vision 2021 aims to make the UAE among the best countries in the world.**

- The vision identifies six pillars/ national priorities that represent the key focus sectors of government action in the coming years.



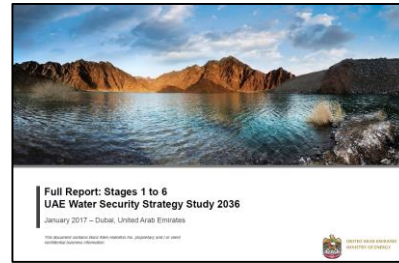
# To ensure Water Security ,Food and Energy Security objectives are met,

## National Energy Strategy 2050(Launched in 2017)



Aims to increase the contribution of clean energy in the total energy mix from 25 per cent to 50 per cent by 2050

## UAE Water Security 2036 (Launched 2018)



Aims to ensure sustainable, continuous access to safe and adequate quantities of water, under normal and emergency conditions.

## UAE Food Security Strategy 2051 (Launched 2019)



Aims to implement resilient agricultural practices that increase productivity and production, and help maintain ecosystems.

### Objectives:

- 50% Clean Energy in Capacity Mix by 2050 in Supply side .
- Demand reduction vs. Business as Usual by 2050 in Demand Side

- Sustainable and continuous access to safe water
- Reduce agricultural water demand
- Increase percentage of RO

- Enhance local production of food that contributes to food security



Alignment



# National Energy Strategy 2050

## Supply side

**50%** Clean  
Energy in Capacity  
Mix by 2050



## Demand side

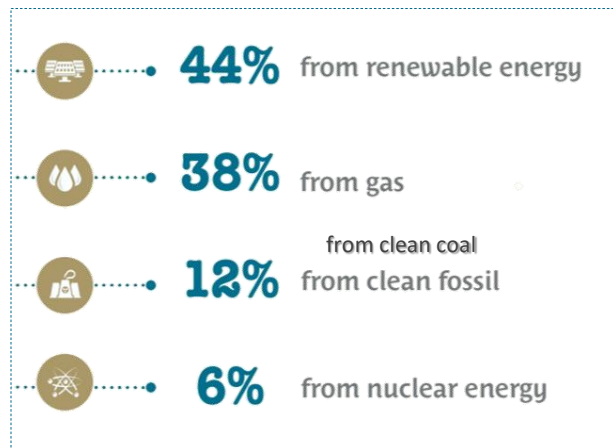
**40%** Final Energy  
Demand reduction vs.  
Business as Usual by  
2050



**The launch of the National Energy Strategy 2050 was through a visualization tool and a strategy game** to include all the key stakeholders across the public and private entities in the energy sector who will be the enablers of the strategy. The energy strategy game was designed in partnership with the Prime Minister's Office and allowed the stakeholders to stress test the scenarios which were created to envision the future of the energy sector. The various challenges which needs to be overcome to achieve the set targets for clean energy and demand side reduction were highlighted through this process

# The Final Solution: National Energy Strategy 2050

## Future Energy Mix



**25-50%**

The plan will increase the contribution of clean energy 25-50% by 2050

**70%**

Will reduce carbon emissions resulting from the power generating process by 70%

**40%**

Improve energy efficiency by 40% by the middle of the century

**6%**

Annual growth in demand for energy stands at 6%

**AED 700 BN**

Savings resulting in AED 700 billion worth



# UAE Water Security 2036 Framework

## A Overarching Objective and Policies

Ensure sustainable and continuous access to safe and adequate quantities of potable water, under normal operations and during large-scale emergency situations impacting the entire nation

## B Strategic Programs and Focus Areas

**I Demand Side Management (DSM)**

- Potable water demand reduction
- Agriculture water demand reduction
- Reduction of non-revenue water
- Price signaling and cost recovery

**II Supply Side Management**

- Expansion of sustainable / membrane-based seawater desalination
- Increase in treated sewage effluent usage
- Conservation and optimization of groundwater usage

**III Production and Distribution Emergencies**

- Interconnections between Emirates
- Strategic storage
- Water tankers and filling stations
- Enhanced transmission networks
- Oil spill prevention

## C General Enablers

**1 Institutional Setting & Capacity Building**

**3 Technologies and Research**

**2 National Policies, Plans and Regulations**

**4 Public Awareness**



# UAE Food Security Strategy 2051

- Aims to implement resilient agricultural practices that increase productivity and production, and help maintain ecosystems.
- Enhance local production of food that contributes to food security

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- **The strategy defines the elements of the national food basket, which includes 18 main types, based on 3 main criteria:**
    - knowledge of the volume of domestic consumption of the most important products
    - production capacity
    - processing and nutritional needs.

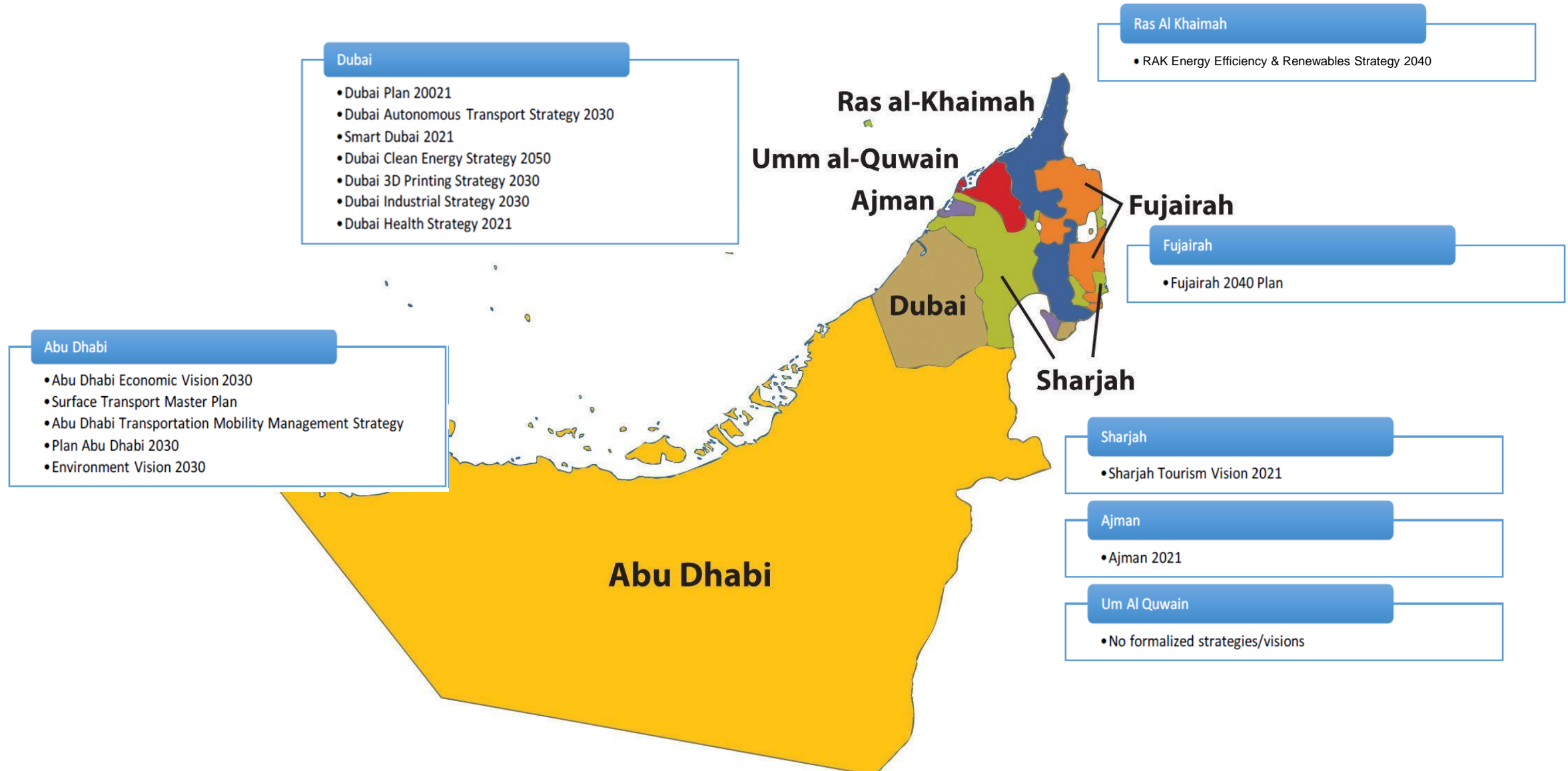


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- **It includes 38 short and long-term key initiatives and is geared by 5 strategic goals focusing on:**
    - facilitating the global food trade
    - diversifying food import sources
    - identifying alternative supply schemes, covering three to five sources for each major food category.



# To ensure Water Security and Energy Security objectives are met,

## Emirate level visions, strategies and plans





# Water , Food and Energy Security are essential to our Future

- ❖ Water , Food and Energy Security are absolute priorities for the UAE and must be aligned to ensure the SUCCESS of all.
- ❖ The need to decouple water production from power generation .
- ❖ To achieve a sustainable infrastructure for generating power through renewable energy.
- ❖ Current crop cultivation contributes only 11% to Food Security self sufficiency target with target to increase to 15 % used by focusing on smart agriculture technology
- ❖ To achieve a sustainable infrastructure for generating power through renewable energy.
- ❖ The cost competitiveness of solar power, which we have seen over the past five years, has the potential for efficient decoupling of power and water production.





# Water, Food and Energy Security Alignment Program creates a win-win future for WEF Nexus of the UAEvc



## Smart Governance

- ❖ Coordination between Water ,food and Energy Agriculture Sectors
- ❖ National coordination between agriculture sector and food security objectives
- ❖ National groundwater management program



## Informed Decision Making

- ❖ Timely and accurate agriculture & groundwater data
- ❖ Consistency between Emirate level and Federal datasets
- ❖ Up-to-date groundwater monitoring system



## Agriculture & Water Productivity

- ❖ Irrigation system efficiency
- ❖ Assistance to enhance farmers' capacity and knowhow
- ❖ Align crop selection with food security needs
- ❖ Enhance water productivity in cultivation



## Financial Incentives

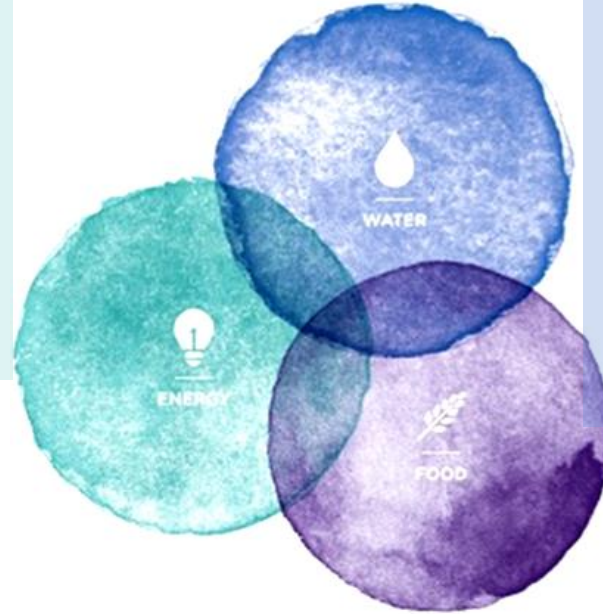
- ❖ Incentivize food security and efficient water management practices
- ❖ Price Groundwater to encourage highest and best use and zero waste( Proposal :Socio economic study)





# UAE Water-Food Nexus Initiatives

- Taqa Technology incubation unit, Abu Dhabi
- RO plants currently receive renewable sources of electricity through the existing energy mix (which includes PV, CSP and Nuclear) however only one project exists that directly couples renewables and desalination, the Masdar Renewable Energy Water Desalination Programme at Ghantoot, Abu Dhabi
- Various plants that use Combined cycle - MSF/MED across the UAE (i.e. Jabal Ali M)



- Livestock Chain Monitoring Committee, Ministry of Climate Change and Environment, UAE
- The Abu Dhabi Farmers' Services Centre Breeding Programme
- Sewage used in landscaping, Ajman
  - Environmental impact assessment of TWW in agriculture, Abu Dhabi
  - Treatment of municipal wastewater for agricultural use, UAE
  - ADFCA project on wastewater treatment use for irrigation of 143 farms, Abu Dhabi
- A number of smart greenhouses are emerging in the UAE, such as:
  - Pure Harvest, UAE
  - Van der Hoeven in Al Ain

- Integrated Seawater Energy and Agriculture System (ISEAS), Masdar City, Abu Dhabi
- ISEAS Masdar project on bioethanol production from oil rich native plants  
Study on bioethanol potential of lignocellulosic biomass such as date palm & mangroves
- Neutral Fuels, UAE
- ENOC Biodiesel 5, Dubai
- Lootah fuels, Dubai
- Biodiesel from date pits, UAE
- Cooking oil to biodiesel fueling station in Jebel Ali, Dubai
- Cooking oil to biodiesel at Tadweer, Abu Dhabi Biojet initiative, Abu Dhabi





# The role of private sector

- ❖ Technology provider
- ❖ Enhance and building the capacity .

An aerial photograph of a beach with turquoise waves crashing onto the shore, creating white foam. The text "THANK YOU" is overlaid in the center.

**THANK YOU**