



# Environment in the UAE

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# The Oil Industry in the United Arab Emirates

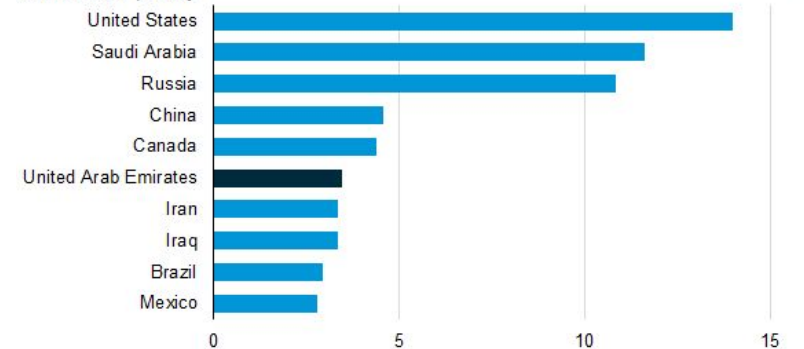


# Background/Today

- Previously dependent on fishing
- First commercial discoveries of oil (1958):
  - Bab-2
  - Umm Shaif
- ADNOC/Abu Dhabi
- World's sixth largest oil reserves:
  - Third largest crude oil exporter
  - 40% of the country's gross domestic product



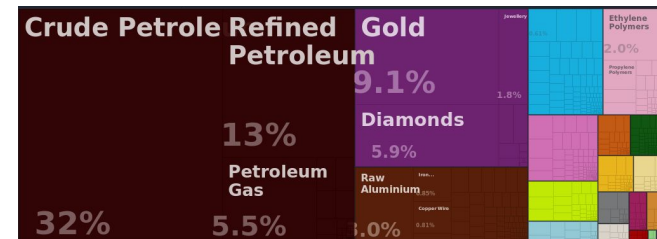
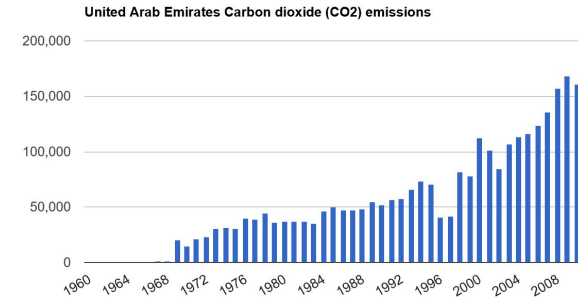
Top 10 global oil producers (2014)  
million barrels per day





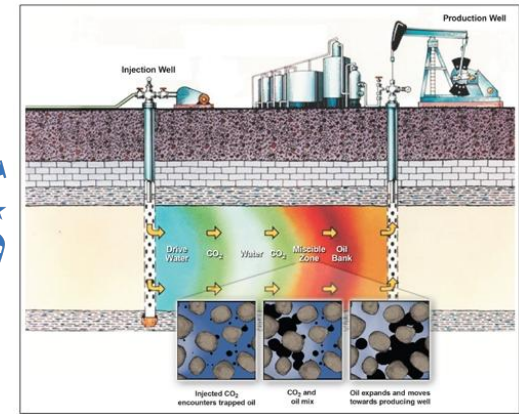
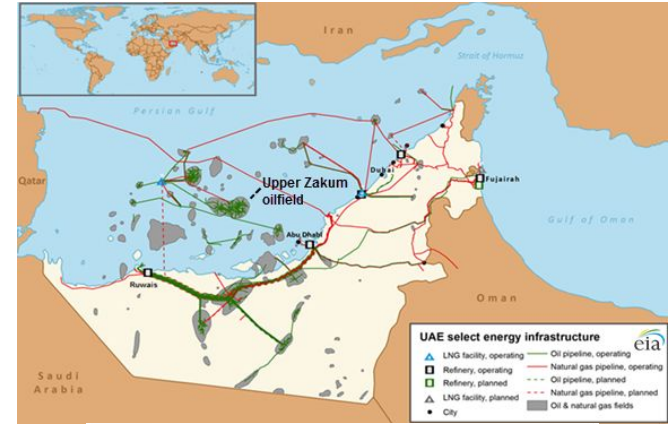
# Environmental Impacts

- Oil spills
  - Fujairah
  - March 13, 2017
- Other direct impacts:
  - Terrain destruction
  - Noise/vehicular pollution
  - Grading the land
- Indirect impacts:
  - Soil erosion
  - Air pollution
- Global Warming
  - 167,597 metric tons of carbon (2010)
  - Stockholm Environment U.S. Institute forecast



# Future Plans for the Industry

- Increase in oil production
  - 30% by 2020
- EOR drilling
- IMF
  - Oil-producing countries have the highest energy subsidy bills
  - GCC
- Monitor/investigate oil spills
- Monitor greenhouse gas emissions



# Sources:

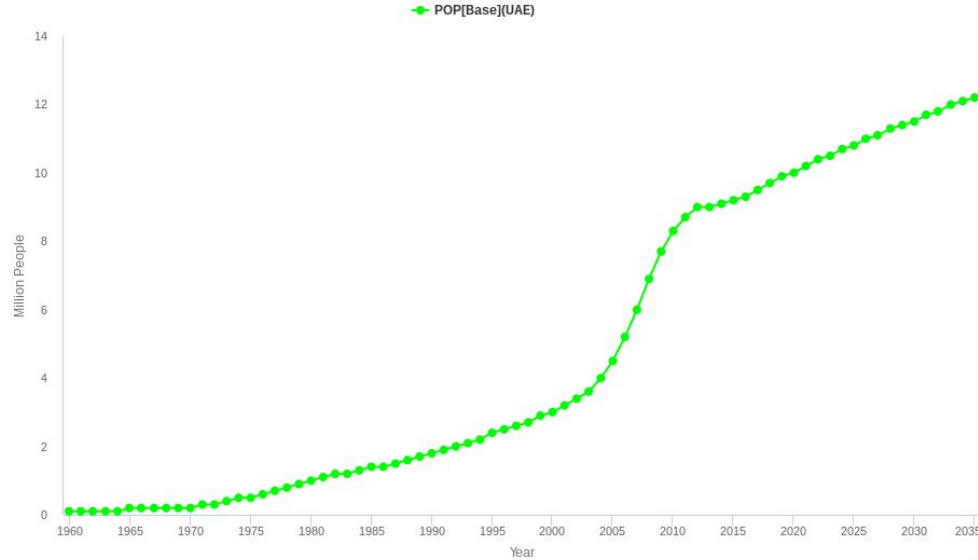
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- [http://www.stltoday.com/business/imf-says-more-reforms-still-needed-by-mideast-oil-exporters/article\\_7e4c73fe-8376-5526-8cec-23a23955849e.amp.html](http://www.stltoday.com/business/imf-says-more-reforms-still-needed-by-mideast-oil-exporters/article_7e4c73fe-8376-5526-8cec-23a23955849e.amp.html)
- <http://www.thenational.ae/business/oil/end-of-a-75-year-era-of-oil-fuelled-progress-for-abu-dhabi#full>
- [http://www.opec.org/opec\\_web/en/about\\_us/170.htm](http://www.opec.org/opec_web/en/about_us/170.htm)
- <http://www.thenational.ae/news/uae-news/environment/uae-has-worlds-largest-environmental-footprint>
- <http://www.nytimes.com/2010/10/28/business/energy-environment/28dubai.html>

# Historically Unique Environmental Problems

- New country
- Modern problems
  - allow for rapid economic growth
    - environmental consequences-> forefront of environmental protection and renewable energy
- Today, younger population
  - Care about world

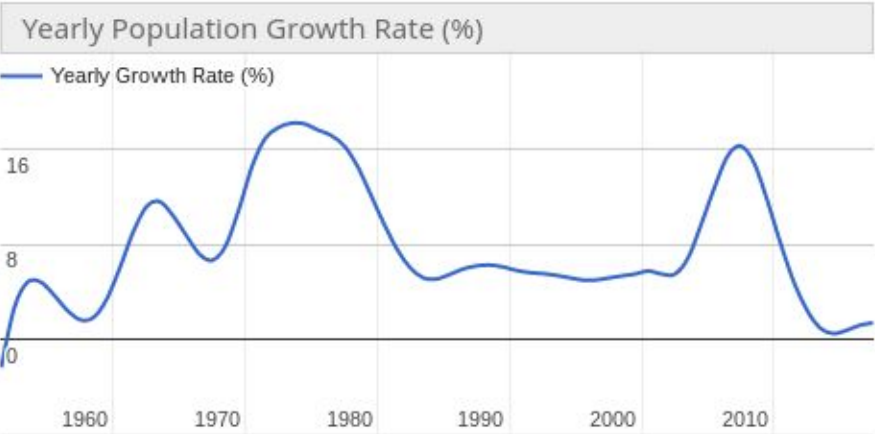
# Population Growth Projection

- Small but growing
- Urban
  - 86.7% by 2020 (7.9 million)
- Lifestyle
  - Lavish- hotels, manmade islands, etc.
    - Building projects
- Resource Use
  - Share limited number
    - (need more->more waste)
  - Food (less than 15% rural) and freshwater
  - Fossil fuels





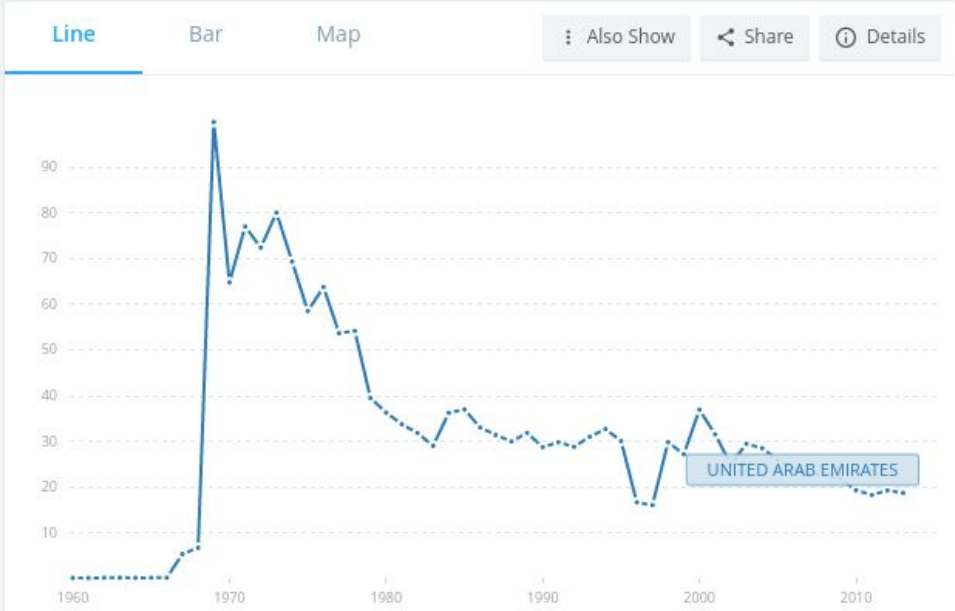
UNITED ARAB EMIRATES POPULATION



CO2 emissions (metric tons per capita)

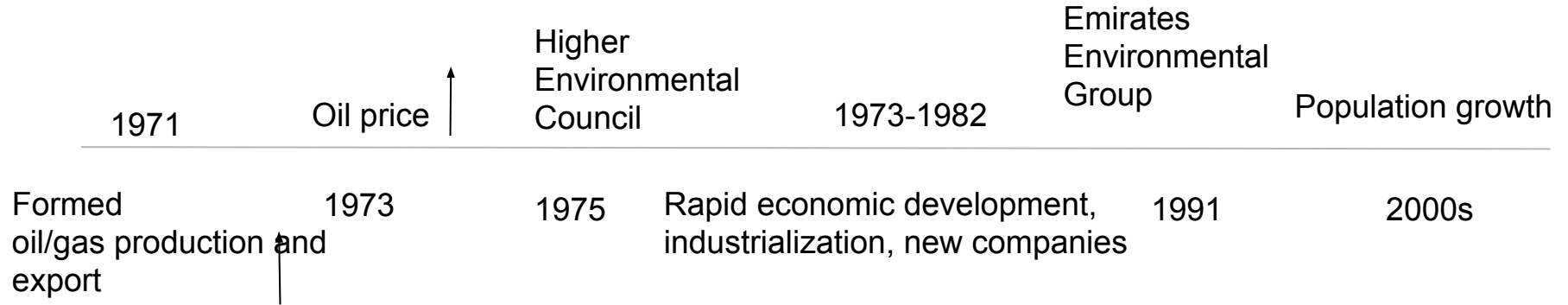
Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States.

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# Economy, Population, and Environment

- 1970s small population; industrialization and resource extraction
  - since 1970s: downward trend of carbon emissions.
    - CO2 per capita: 1971 80 metric tons; 2007 31 metric tons
      - Today, significantly higher population
- As industrializing, environmental organizations





# Environmental Costs

- Air Pollution
  - World Bank: most polluted air
    - PM2.5
    - 8th most CO2 per capita
    - Carbon-based vs dust from sand
- Loss of Natural Habitat
  - Real estate development
    - (islands, buildings)
  - Wildlife habitat, shoreline erosion
- Climate
  - CO2 emissions
  - Arid desert climate->natural disasters, drought
    - Water use: pollution, salinity



# Dubai- Rapid Urbanisation

- Why?
  - “Business first”
    - Skyscrapers, etc; environmental standards?
    - Industrial projects vs energy consumption
- Energy to support lifestyle
- Waste treatment, freshwater
  - Gulf (desalination)-> emissions+waste to sea
  - (raw) sewage treatment





# Links to Sources- Population (Beril Saygin)

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[http://www.ifs.du.edu/ifs/frm\\_GraphicalDisplay.aspx](http://www.ifs.du.edu/ifs/frm_GraphicalDisplay.aspx)

# Powering Growing Energy Demands in a Clean Way

- Desalination Plants

- Persian Gulf
- Water security
- Jebel Ali plant produces over 550 Million gallons of water every day
- Major carbon footprint
- Electricity demand -> nuclear energy



# Nuclear Energy

- Looking towards nuclear energy for desalination plants
- Clean, but not renewable
- “environmentally promising and commercially competitive”
- In 2013 the Dubai Electricity and Water Authority stated that they aimed to achieve 12% of the electricity supply to be nuclear powered by 2020
- 4 nuclear reactors planned to be running by 2020
- Emiratis want to use these reactors as a symbol to “prove themselves”

<https://www.venturesonsite.com/news/tag/emirates-nuclear-energy-corporation-enec/>



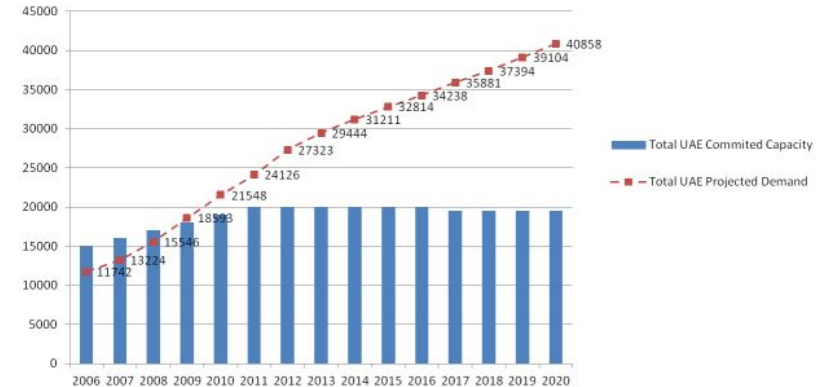
# Barakah Reactors

- First reactor planned to start up in 2018
- Each will have a 60 year life-span
- Based on western nuclear safety measures
  - Safe reactor shutdown, removal of decay heat, and the prevention of radioactive releases



# Nuclear Energy as a Temporary Energy Source

- Uranium deposits run out?
- Nuclear energy could be used to ensure commercial competitiveness and contribute to environmental prosperity while renewable energy is further implemented.





# Links to Sources-Nuclear Energy (Nick Radwin)

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<https://www.enec.gov.ae/>

# Renewable Energy in the United Arab Emirates

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# Reasons to Implement Renewable Energy Sources

- Solar potential
  - UAE is a desert region
  - Lots of sunlight
- Waste to Energy Potential
  - 1.86kg of solid waste/person
  - Target - 75% waste diverted from landfills by 2021
- Business opportunities
  - Opportunities for profit
  - 40% owned by private companies



# Initiatives Taken to Help Pollution

- Legal Restrictions
  - Environment Protection and Development Law
- Government Bodies
  - Environmental Agency of Abu Dhabi
  - Abu Dhabi Urban Planning Council
- Trees
  - Re-forestation - 70% total greenery
  - Reduced Carbon footprint



# Masdar City

- Completed Projects
  - Shams 1
    - 100 MW solar-thermal
  - 10MW Plant/ Masdar Institute Roof
    - Overall 19.100 MW/year
    - 11,000+ tons of Carbon emissions displaced
    - Produces the
  - Carbon Capture, Usage, and Storage
    - 800,000 tons of Carbon taken in/year
  - Several others in UK, Spain, Jordan





# UAE Plans for the future

- Investment of 163 billion dollars
- 2050 goals
  - 44% Renewable energy
  - 38% from gas
  - 12% clean fossils
  - 6% nuclear
- Projects
  - 1000 MW solar power plant by 2030
  - 25% Renewable energy by 2030



# Link to Sources - Renewable Energy (Ben Felson)

<https://www.export.gov/article?id=United-Arab-Emirates-Renewable-Energy>

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