



Department of Physics (Covenant University)  
1<sup>st</sup> Town & Gown 2018 Seminar Series

***Career Talk in Petroleum Geoscience &  
Prospectivity for Allied Disciplines***

Presented By:

**Olumide Lawal,**

**Chevron Nigeria Ltd, Lagos**



# Brief Personal Intro....Who Is This?

- **Olumide 'Funso Lawal**

- BSc Geology, OAU, Ile-Ife (1997)

- MSc Petroleum Reservoir Systems, Colorado School of Mines, USA (2008)

- Short stint as a banker spanning almost 3 years in three Nigerian banks

- 17<sup>th</sup> year working as an Earth Scientist with Chevron Nigeria Ltd, Lagos

- 9<sup>th</sup> year teaching Seismic Interpretation & Integration of Subsurface Data in the MSc Geophysics program with the University of Lagos

- Parent, Mentor, Coach, Teacher, Supervisor, Volunteer.....

- Mid 40's & happily married with 4 kids

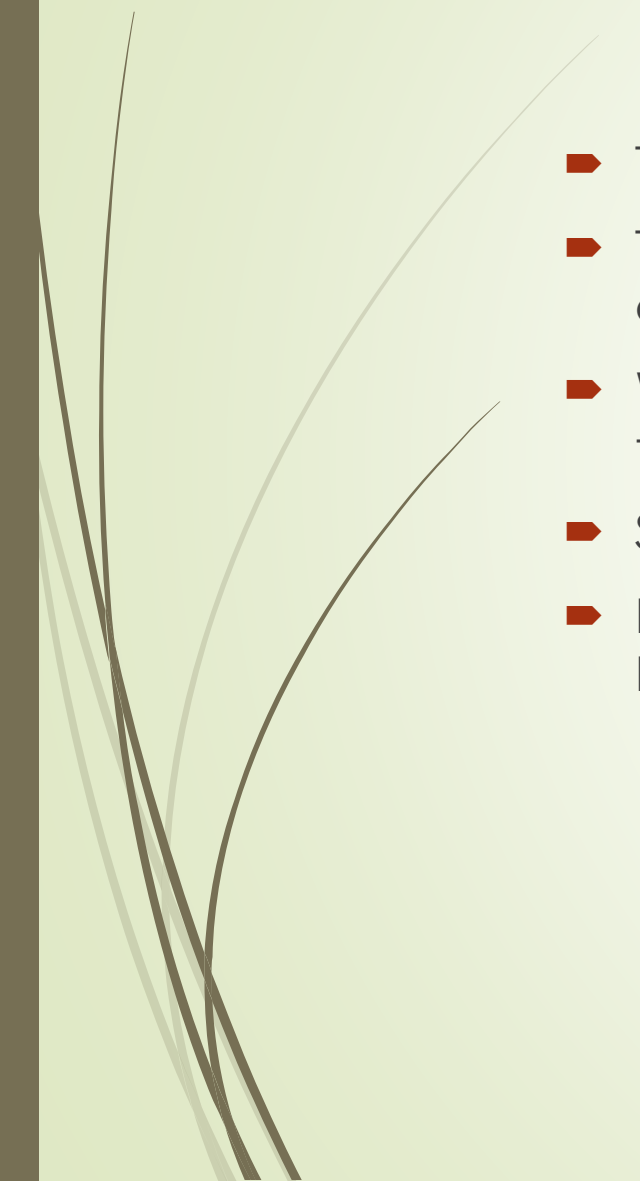


# CVX Career Journey So Far.....

- ▶ Joined Dec, 2001
- ▶ Project ES on a key offshore gas asset with over 1 TCF of reserves
- ▶ Development Geologist on several offshore assets with combined oil in place numbers of over 3 billion STB comprising about 200 wells
- ▶ Well Planner/Project ES for on a deep water asset with average daily production of 250,000 barrels & oil reserves of over 1 billion barrels
- ▶ Currently ES Team Lead, JV New Field Development with direct joint supervision of about 10 people having responsibilities of harnessing new opportunities to grow Chevron Nigeria JV production

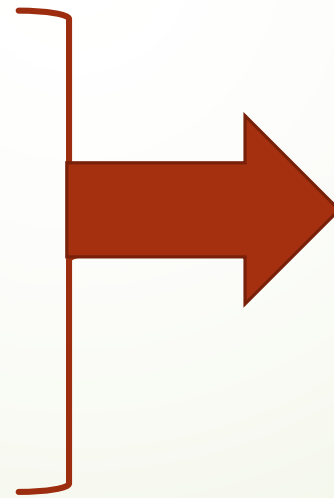


# Why Fossil Fuels (Petroleum mainly)

- ▶ The world depends on it – needs energy to keep going
  - ▶ They continue to play a dominant role in the current energy mix for human consumption
  - ▶ Was a key enabler for the Industrial revolution which has recorded tremendous progress in the technological, economic and social spheres
  - ▶ Significant caloric content compared to other energy sources
  - ▶ Key driver for the Nigerian economy as it accounts for a good chunk of her FX inflows and GDP
- 

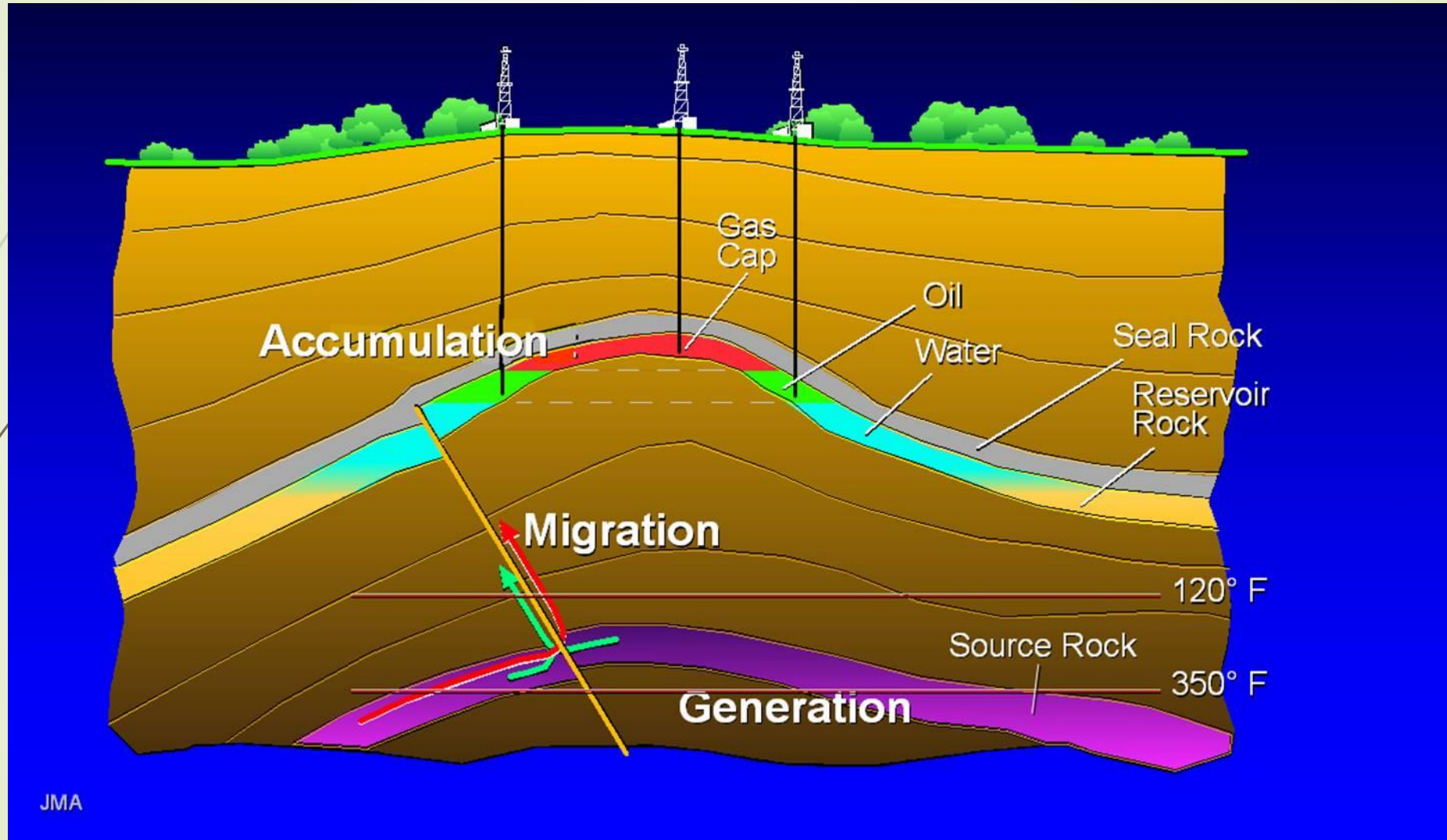
# Petroleum Geoscience (Overview)

- ▶ Hydrocarbons are the main constituents of Petroleum (basic chemistry)
- ▶ Petroleum Geoscience is the application of **geology (study of earth, materials and processes) & geophysics (the physics of the earth)** to the exploration and production of oil and natural gas
- ▶ A petroleum system is the sum total of all the elements necessary for the **deposition, processing, generation, transportation, trapping & accumulation** of the 'raw materials' and they include the following:
  - ▶ Source rocks
  - ▶ Reservoir rocks
  - ▶ Seal rock
  - ▶ Overburden rocks
  - ▶ Traps
  - ▶ Migration pathways



**Favorable timing**

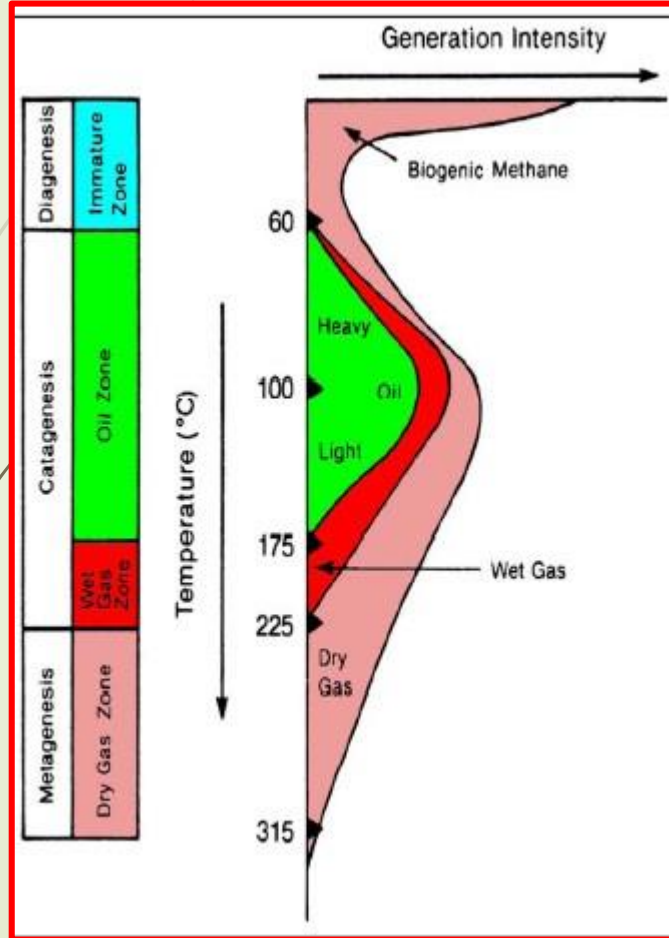
# Schematic Petroleum System



In Nigeria, hydrocarbons are explored for in Petroleum systems located onshore (land and swamp), offshore & in the deep water environments

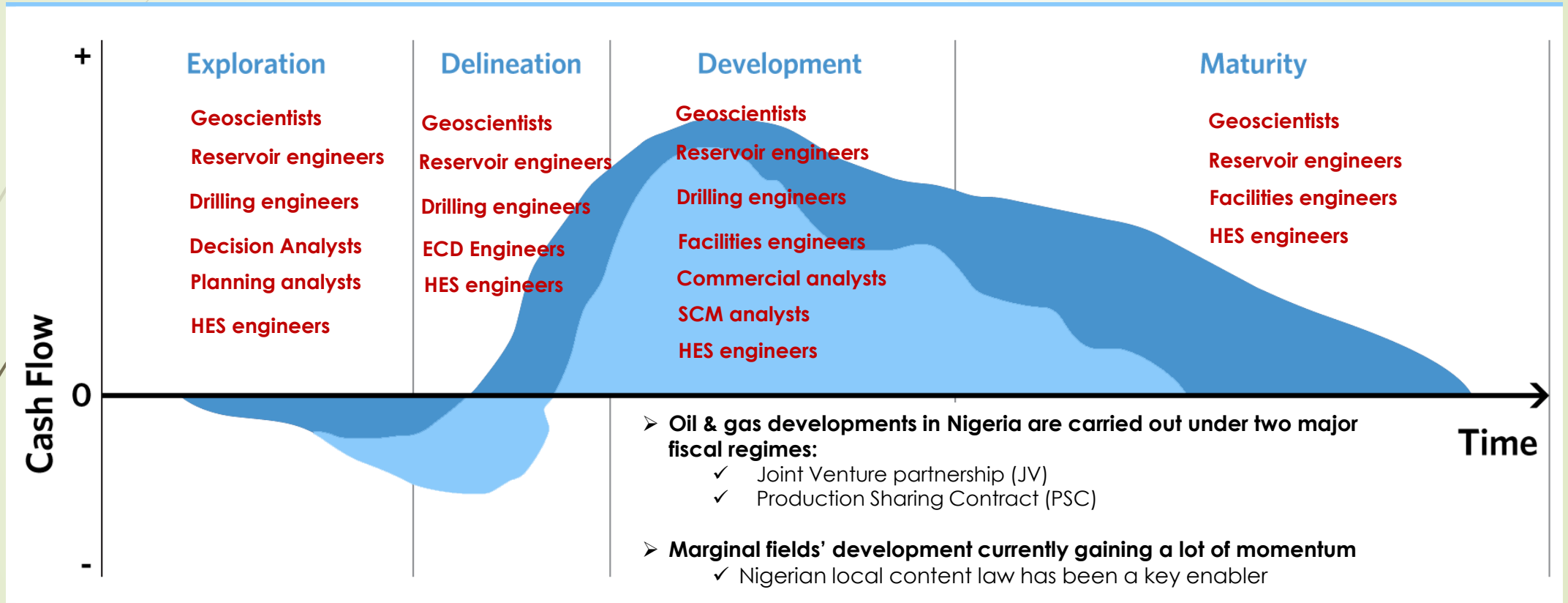
JMA

# Petroleum (Oil & Gas) Kitchen



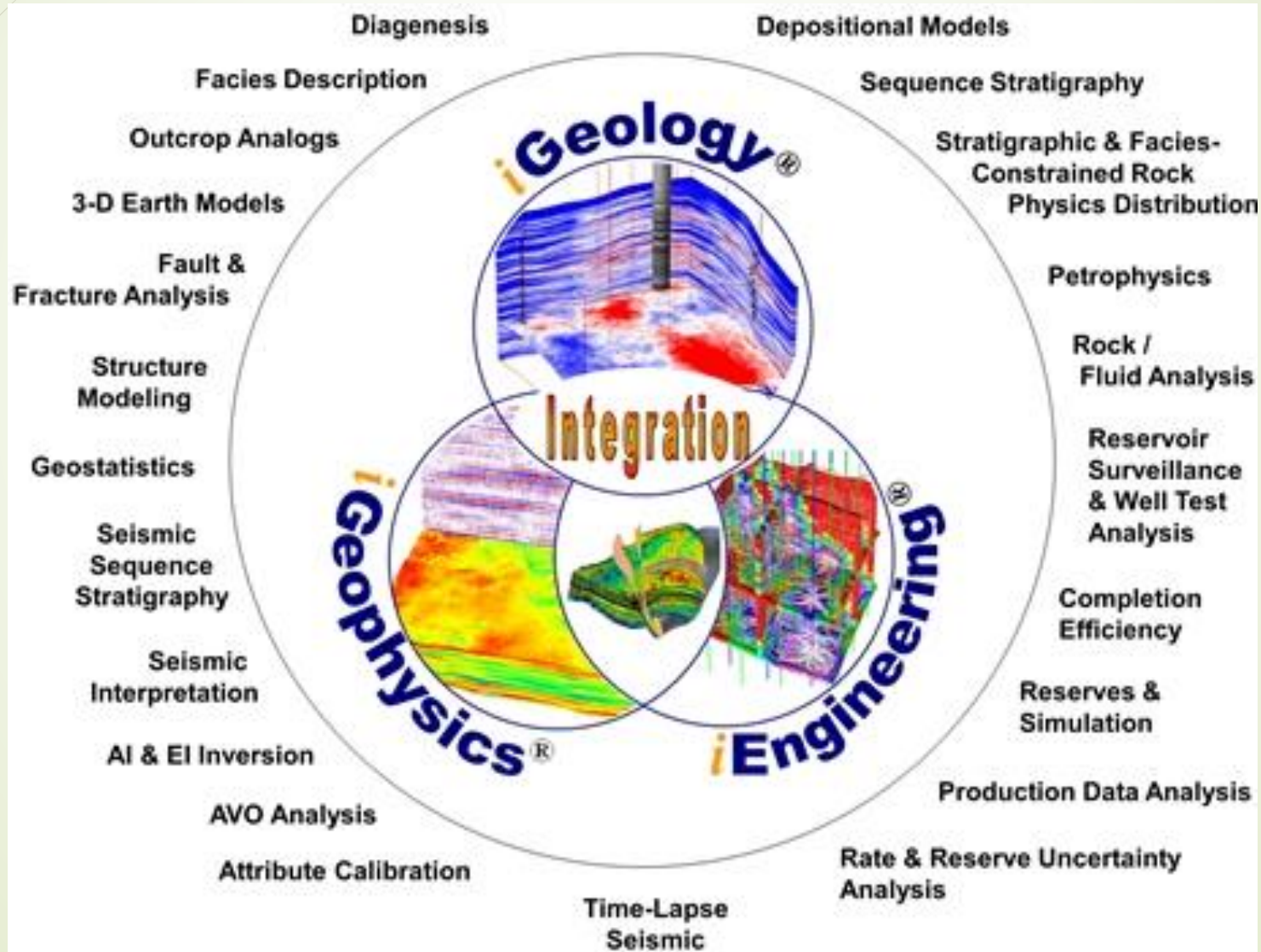
Oil/gas window	Depth (km)	Temp (°C)	Spore Colour Index	Vitrinite Reflection	Subsurface process	
Kerogen	1	30	1	0.5	Diagenesis	Immature (small quantities of early methane, biogenic)
	2	60	4			
	3	90	5			
Oil	3	90	6	1.2	Katagenesis	Initial maturity (zone of oil generation)
	4	120	7			
Wet Gas	5	150	8	2.0	Metagenesis	Condensate/ Wet gas
	5	150	9			
Dry Gas	6	250	10	5.0	Metamorphic	High temperature methane

# Typical Life Cycle of Oil & Gas Fields





# Cross-Functionality in Asset Management



Sum total of all these workflows results in D&C ultimately drilling the well to bring forth the desired production of hydrocarbons




# Functional Roles - Geologists

- ▶ Key roles in Exploration and Development
  - ▶ ***Seismic interpretation***
    - ▶ structural framework
    - ▶ Stratigraphic mapping
  - ▶ ***Stratigraphic analyses/facies modeling***
  - ▶ ***Reservoir characterization***
  - ▶ ***3D Earth modeling***
  - ▶ ***Well planning***



# Functional Roles - Geophysicists

- ▶ Key roles in Reconnaissance survey, Seismic acquisition & processing, Exploration and Development Geoscience
    - ▶ ***Seismic interpretation***
      - ▶ Structural framework
      - ▶ Amplitude analyses
    - ▶ ***AVO/AVA analyses***
    - ▶ ***Seismic modeling & inversion***
    - ▶ ***Velocity analyses & time-depth relationships***
    - ▶ ***Time lapse seismic***
- 



# Functional Roles – Possible Career Paths for Physicists & Electronics Engineers

- ▶ Key roles in the Facilities Engineering space, Drilling & Completion Instrumentation, Seismic acquisition & Processing
  - ▶ ***Instrumentation & Electrical***
  - ▶ ***Process Engineering***
  - ▶ ***MWD/LWD instrumentation (especially in the servicing companies)***
  - ▶ ***Seismic acquisition & processing instrumentation***

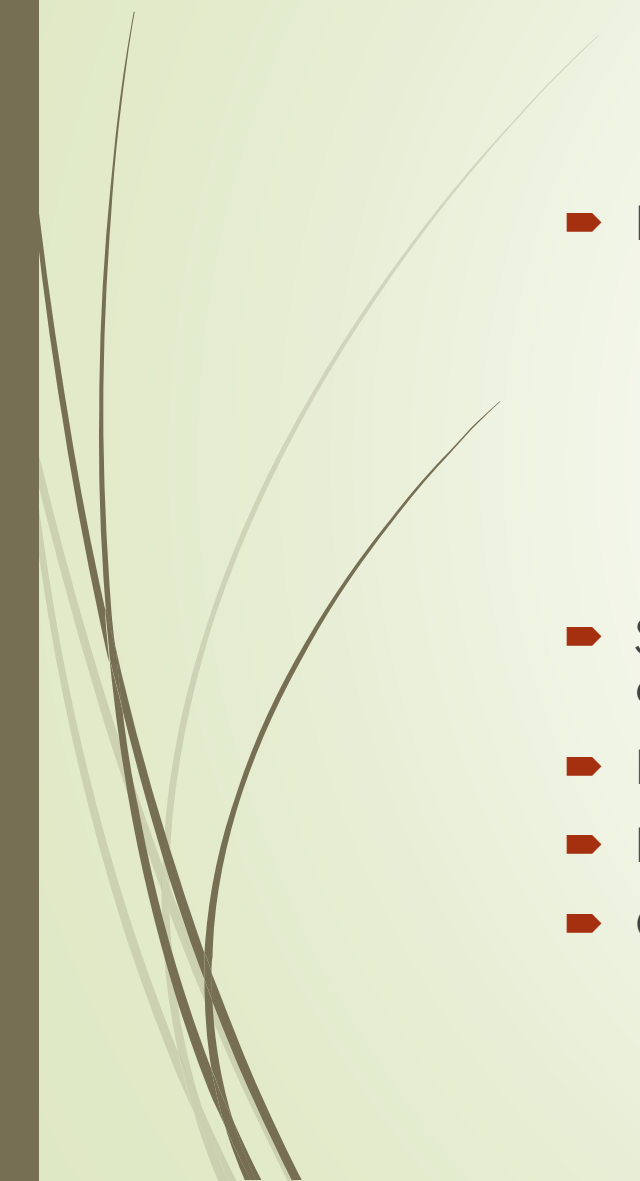


# Functional Roles – Possible Career Paths for IT Applications Engineers

- ▶ Key roles as support/business enablers for ALL units
  - ▶ *Database management*
  - ▶ *HR*
  - ▶ *Finance*
  - ▶ *Security*
  - ▶ *Asset Management*
  - ▶ *D&C*
  - ▶ *ALL onsite & offsite locations*



# Why a Career in Oil & Gas (Upstream)

- ▶ Financially rewarding
    - ▶ *Decent remuneration structures*
    - ▶ *Good pension schemes (mostly closed for most IOCs)*
    - ▶ *Fantastic medical packages*
    - ▶ *Miscellaneous office perks*
    - ▶ *Generous vacation policies*
  - ▶ Strong potential for international exposure working outside of your home country especially when employed by the IOCs
  - ▶ Robust local & international training programs
  - ▶ Excellent cross functional/multidisciplinary work experience
  - ▶ Great opportunities for travels
- 



# Industry Outlook

- ▶ Strengths & Opportunities

- ▶ Strong national going concern

- ▶ Robust demand for global energy consumption

- ▶ Leveraging of technology for efficient exploration & exploitation

- ▶ R&D into more eco-friendly power solutions



# Industry Outlook..../2

- ▶ Threats & Weaknesses
  - ▶ Fluctuations of international commodity prices
  - ▶ Cartel effects
  - ▶ Global shift in energy policy
  - ▶ Non-renewable nature of HC
  - ▶ High risk (high reward)
  - ▶ High development costs





Thanks.....

**Q & A**