Department of Physics (Covenant University) 1st Town & Gown 2018 Seminar Series

Career Talk in Petroleum Geoscience & Prospectivity for Allied Disciplines

Presented By:
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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
  - 17th year working as an Earth Scientist with Chevron Nigeria Ltd, Lagos
  - 9th 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
In Nigeria, hydrocarbons are explored for in Petroleum systems located onshore (land and swamp), offshore & in the deep water environments.
Petroleum (Oil & Gas) Kitchen

<table>
<thead>
<tr>
<th>Oil/gas window</th>
<th>Depth (km)</th>
<th>Temp (°C)</th>
<th>Spore Colour Index</th>
<th>Vitrinite Reflection</th>
<th>Subsurface process</th>
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<tbody>
<tr>
<td>Kerogen</td>
<td>1</td>
<td>30</td>
<td>1</td>
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<td>Diagenesis</td>
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<td></td>
<td>2</td>
<td>60</td>
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<td>4</td>
<td>120</td>
<td>4</td>
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<td>Initial maturity (zone of oil generation)</td>
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<tr>
<td></td>
<td>5</td>
<td>150</td>
<td>5</td>
<td>1.2</td>
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<tr>
<td></td>
<td>6</td>
<td>250</td>
<td>6</td>
<td>2.0</td>
<td>Condensate/Wet gas</td>
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<tr>
<td></td>
<td>7</td>
<td>300</td>
<td>7</td>
<td>5.0</td>
<td>Metamorphism</td>
</tr>
</tbody>
</table>

Immature (small quantities of early methane, biogenic)

Initial maturity (zone of oil generation)

Condensate/Wet gas

High temperature methane

Courtesy Google
Typical Life Cycle of Oil & Gas Fields

➢ Oil & gas developments in Nigeria are carried out under two major fiscal regimes:
  ✓ Joint Venture partnership (JV)
  ✓ Production Sharing Contract (PSC)

➢ Marginal fields’ development currently gaining a lot of momentum
  ✓ Nigerian local content law has been a key enabler
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