



Society of Petroleum Engineers Gulf Coast Section

Mega STEM High School Event

April 6, 2024

Jeannie Chung | Community Services Chair



Gulf Coast Section

Welcome !

Safety Moment



- There are no evacuation drills planned for today but if you do hear the alarm that would be a real emergency.
- In that case, use the designated exits clearly marked with the EXIT sign and follow the evacuation instructions.

Photography



By registering for this event, SPE-GCS reserves the right to use any photograph/video taken at the event without further expressed written permission of those included within the photograph/video. SPE-GCS may use the photograph/video in publications or other media material produced, used or contracted by SPE-GCS including but not limited to: brochures, invitations, books, newspapers, magazines, television, websites, etc.

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2024 Mega STEM
High School Event

8:45 AM – 9:00 AM

INTRODUCTION



Carlos A. Torres
2022-2023 SPE GCS Chair
Royal Oaks Energy Services



9:00 AM – 9:45 AM

HOW STEM IMPACTS THE WORLD WE LIVE IN



Dale Brown
President
Brown Energy Consulting LLC



Saturday April 6, 2024
UH PE Auditorium

Special Thanks
UNIVERSITY of
HOUSTON

9:50 AM – 10:35 AM

PETROLEUM ENGINEERING: BE CAREER FOR THE ENERGY TRANSITION



Xaymaca Bautista
Senior Coiled Tubing and Well
Intervention Engineer
SLB

10:45 AM – 11:30 AM

YOUNG PROFESSIONAL Q&A



Sherry Oyagha
PE PhD Candidate
University of Houston



Alvaro Gomez
Sales & Commercial
Manager
Baker Hughes



Daniela Romero
Finance Planning and
Analysis
Baker Hughes





Gulf Coast Section

Closing Remarks

A brief intro to the O&G Energy Industry – The Journey

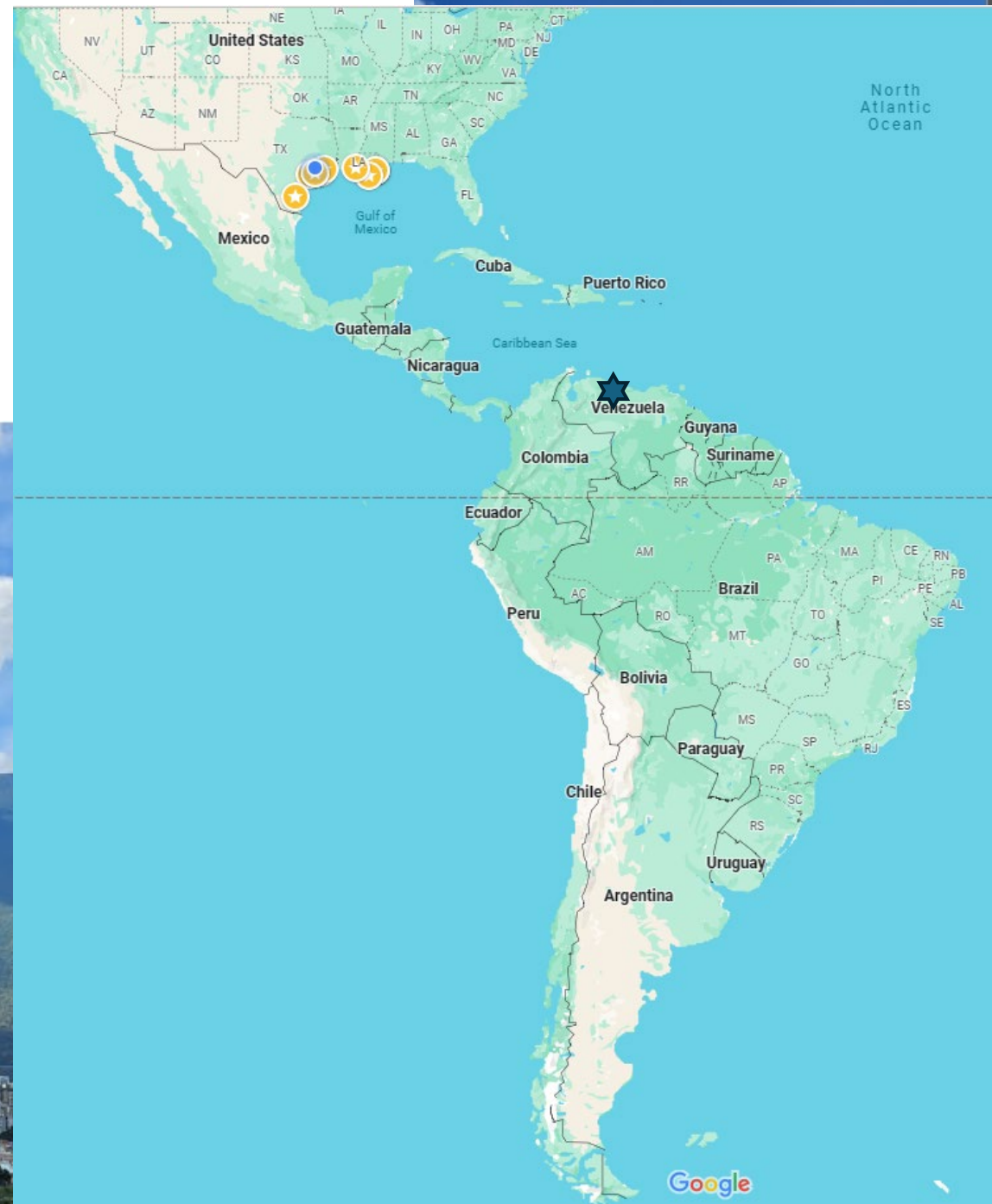
Carlos Torres
SPE GCS Past Chair
Royal Oaks ES President

SPE GCS Community Services Committee High
School STEM event
University of Houston



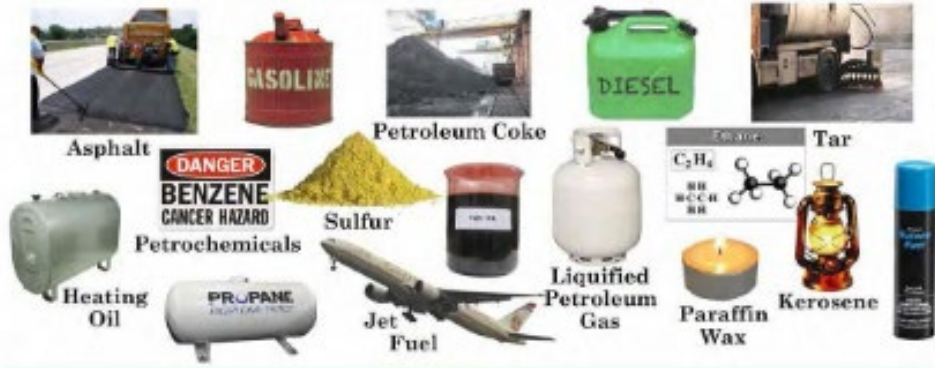
My Background

- Born and raised in Caracas, Venezuela
- High School Chemistry teacher



USES FOR OIL

Common Petroleum Products



Petroleum Is Commonly Used To Make



THINGS MADE FROM OIL

This list represents a fraction of the common, everyday products made from petroleum.

BUILDING & HOME

- paint & brushes
- socket covers
- extension cords
- tape measures

AUTOMOTIVE

- oil filters
- tires
- pylons

KITCHEN & HOUSEHOLD

- plastic bags
- Teflon pots & pans
- Ziploc
- car seats
- lawn chairs
- glasses
- bandages
- inhalers

INFANTS & CHILDREN

- toys
- pacifiers

AROUND THE OFFICE

- printer ink
- CDs
- tape
- sporting equipment
- cameras
- yarn

SPORTS, GAMES & HOBBIES

- camera
- fish
- hair dryers
- jewelry
- makeup
- cologne & perfume
- purses & wallets
- shoes
- tents
- umbrellas

BEAUTY

- hair dryers
- jewelry
- makeup
- cologne & perfume

CLOTHING & TEXTILES

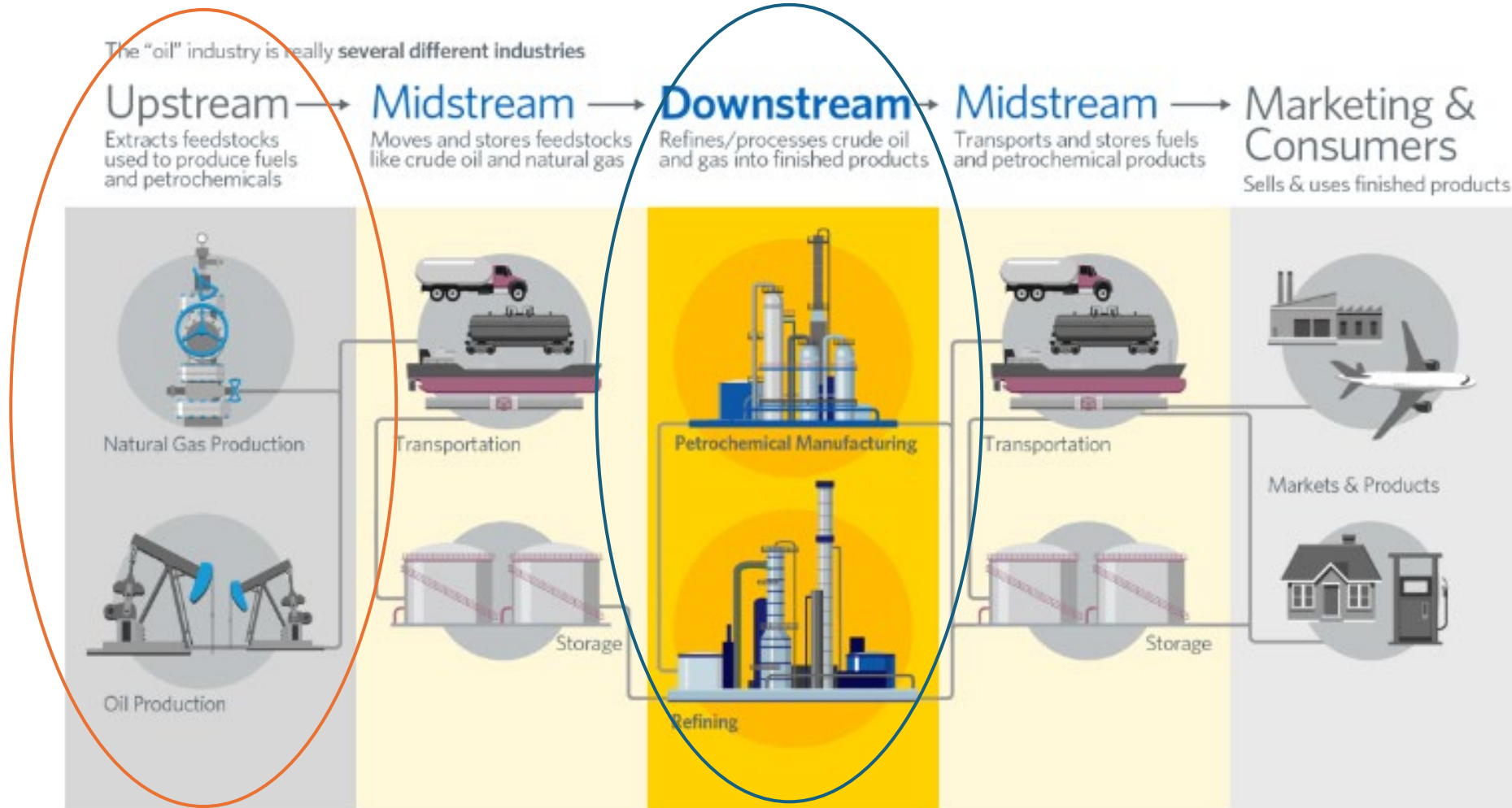
- shoes
- tents
- umbrellas
- irrigation piping

AGRICULTURE

- irrigation piping

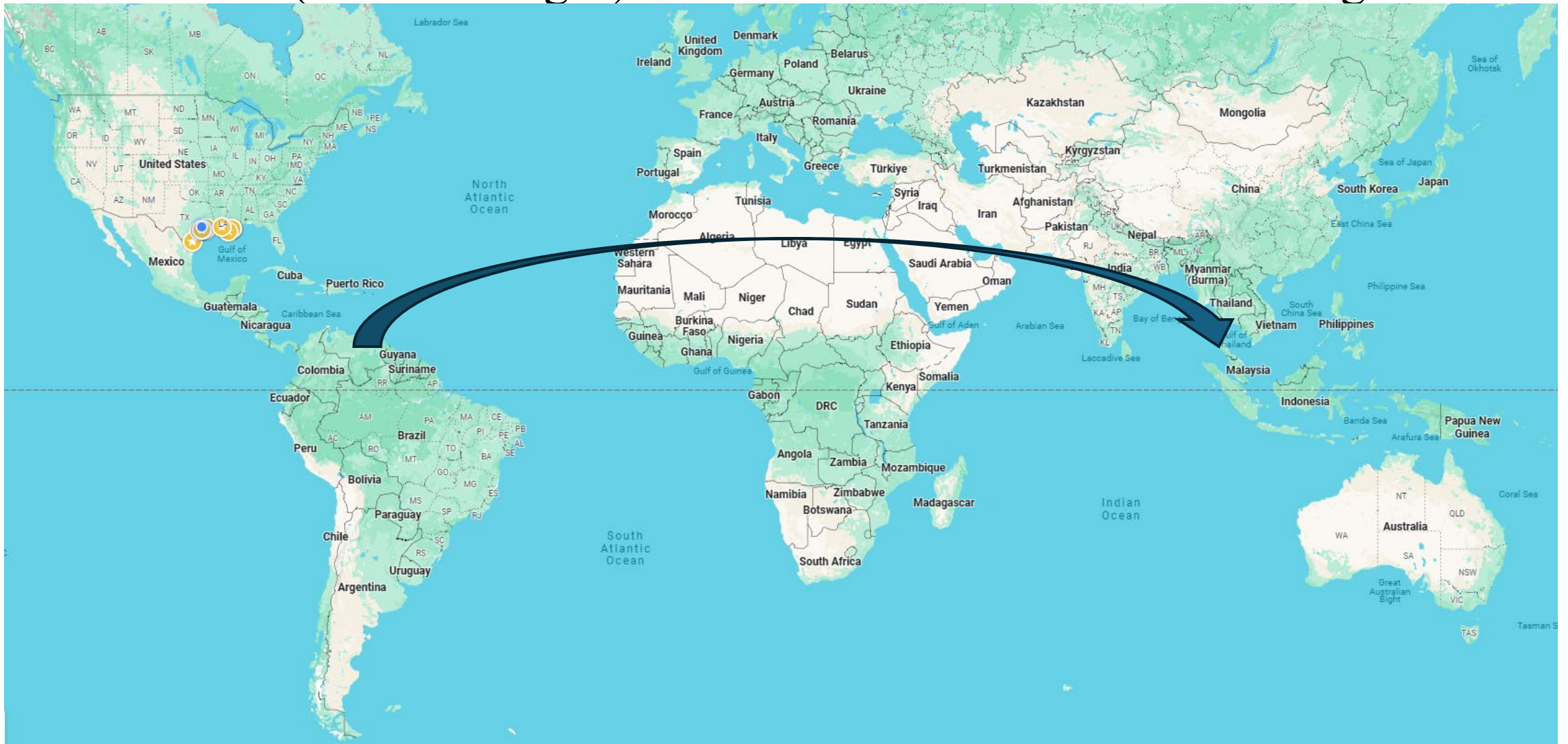
My Background

- BSc Chemical Engineering, year 2000– UNIMET, Caracas, Venezuela
 - Specialized in Downstream- Petroleum processes



Entering the O&G Industry

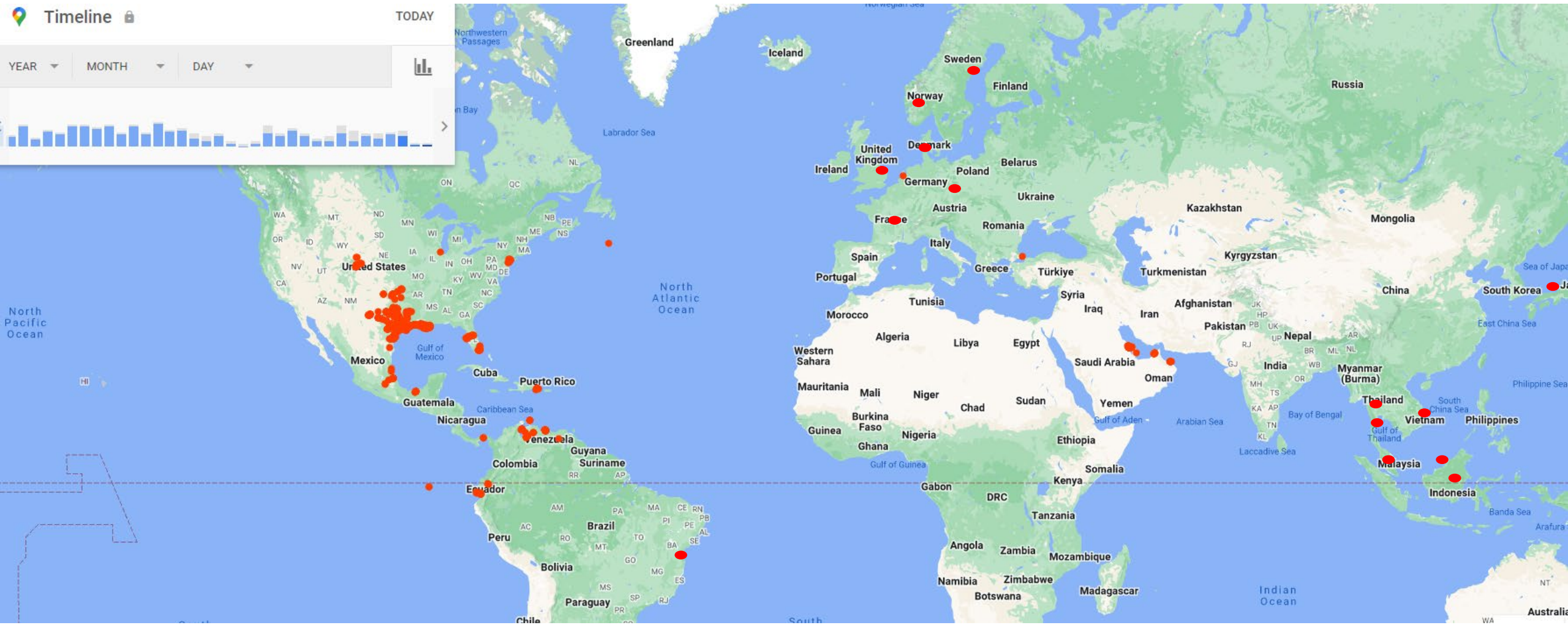
- Joined SLB (Schlumberger) in 2000 as a Well Intervention Engineer



The Field Engineer life (2000-until now!)



Travelled and learned from different cultures



Come August 28th → 24 years in the industry

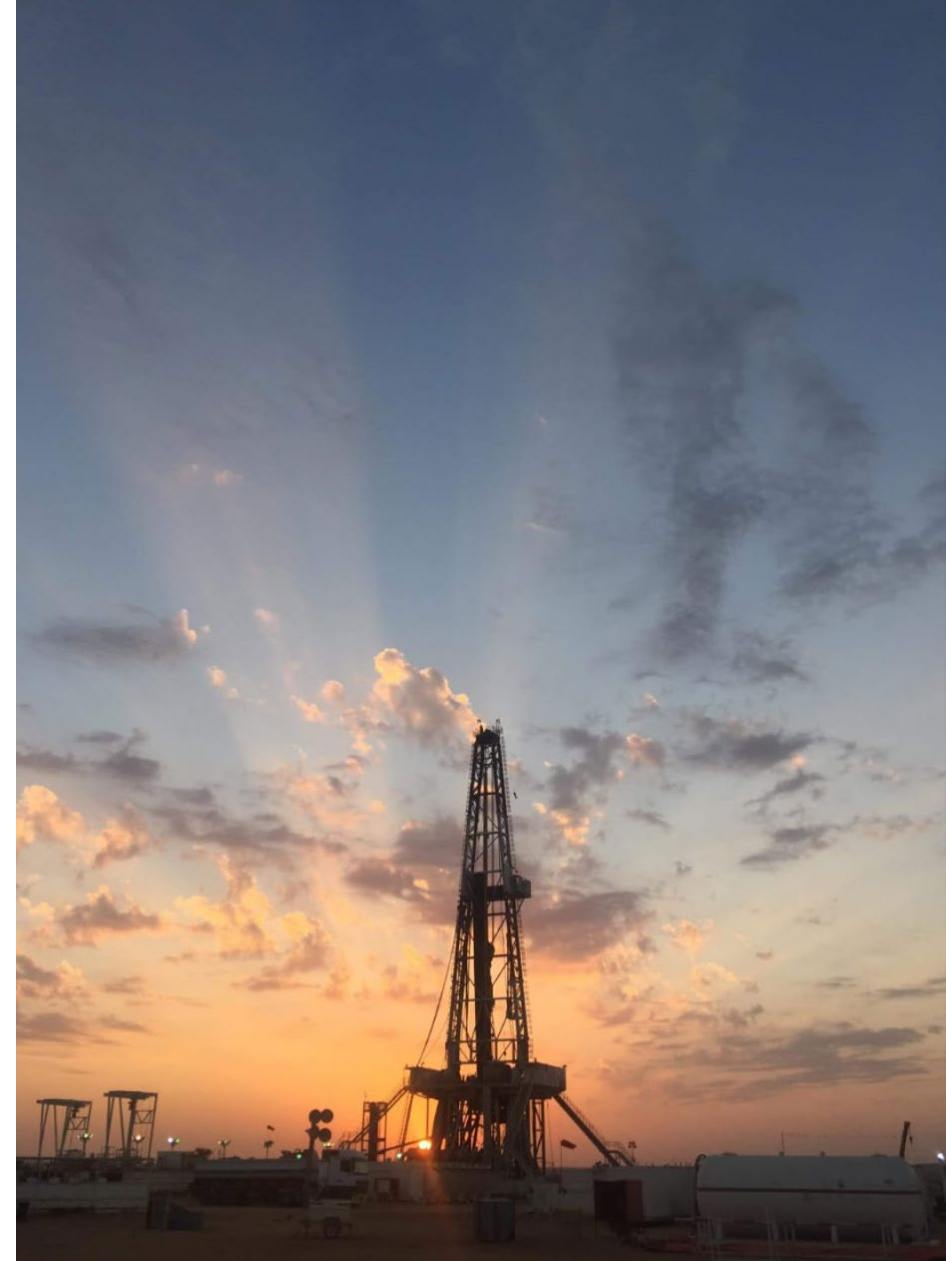
- Chemical engineering
- Mechanical engineering
- Reservoir engineering
- Completions
- Matrix Stimulation
- Hydraulic Fracturing
- Cementing
- Wireline and Slickline
- Downhole tools
- Modeling
- Drilling
- Plug and abandonment
- Geothermal energy
- Business Management
- Sales
- Marketing
- HR
- Procurement
- Finance
- Health Safety and Environment
- Quality
- Logistics
- Leadership
- Data Analytics
- Planning
- Economic Analysis
- Budgeting (Capex, Opex)

What's the takeaway from today?

- Careers and development: you will learn about several other technical and business disciplines
- Multicultural industry
- A world of opportunities
- It's a long journey

What's needed from you?

- Dedication
- Drive and patience
- Passion for what you do
- Always aim to excel



Welcome to the

Society of Petroleum Engineers

Gulf Coast Section

Community Services Committee

MEGA STEM Event

April 6, 2024

HOW STEM IMPACTS THE WORLD WE LIVE IN

Dale Brown

40+ year veteran of the oil and gas industry. Worked for Chevron in four continents over 35 years after graduating with B.S. and M.S. degrees in Petroleum Engineering.

A World Without Technology Energy Production and Delivery



Energy Production



Energy Delivery



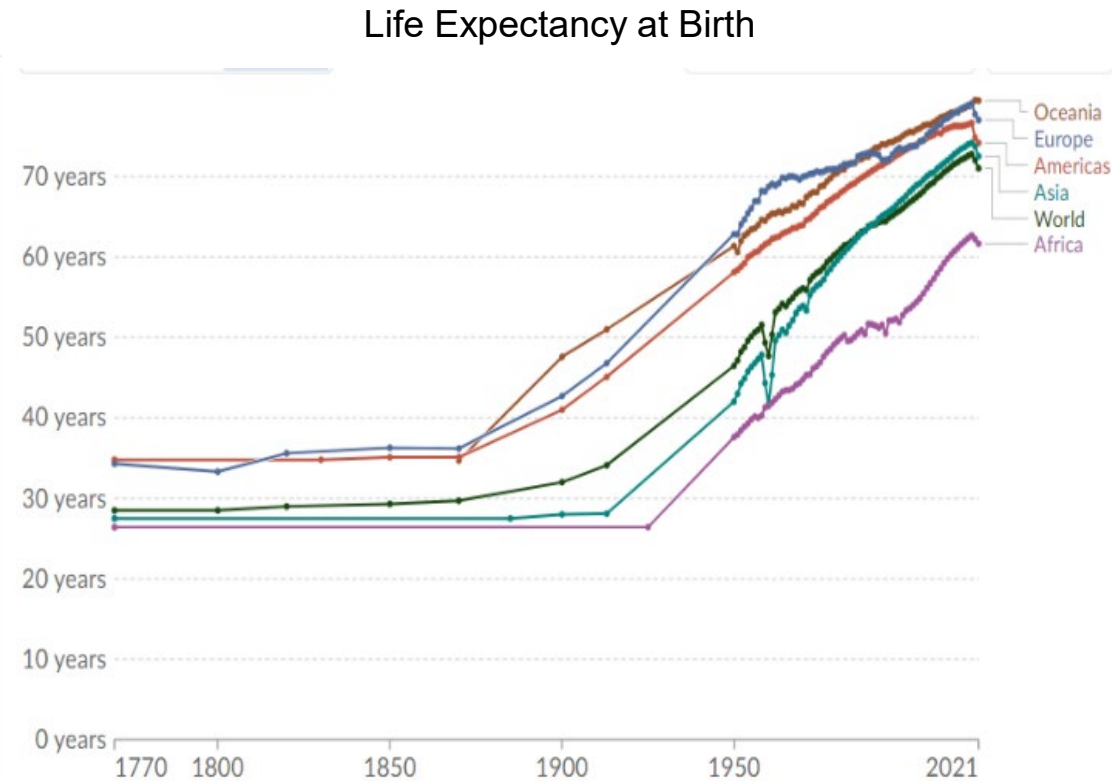
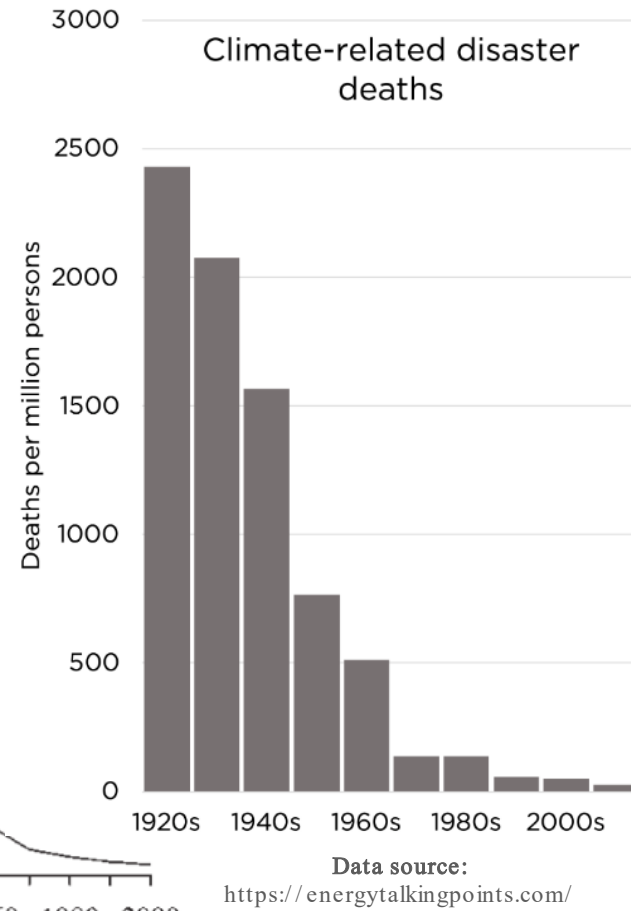
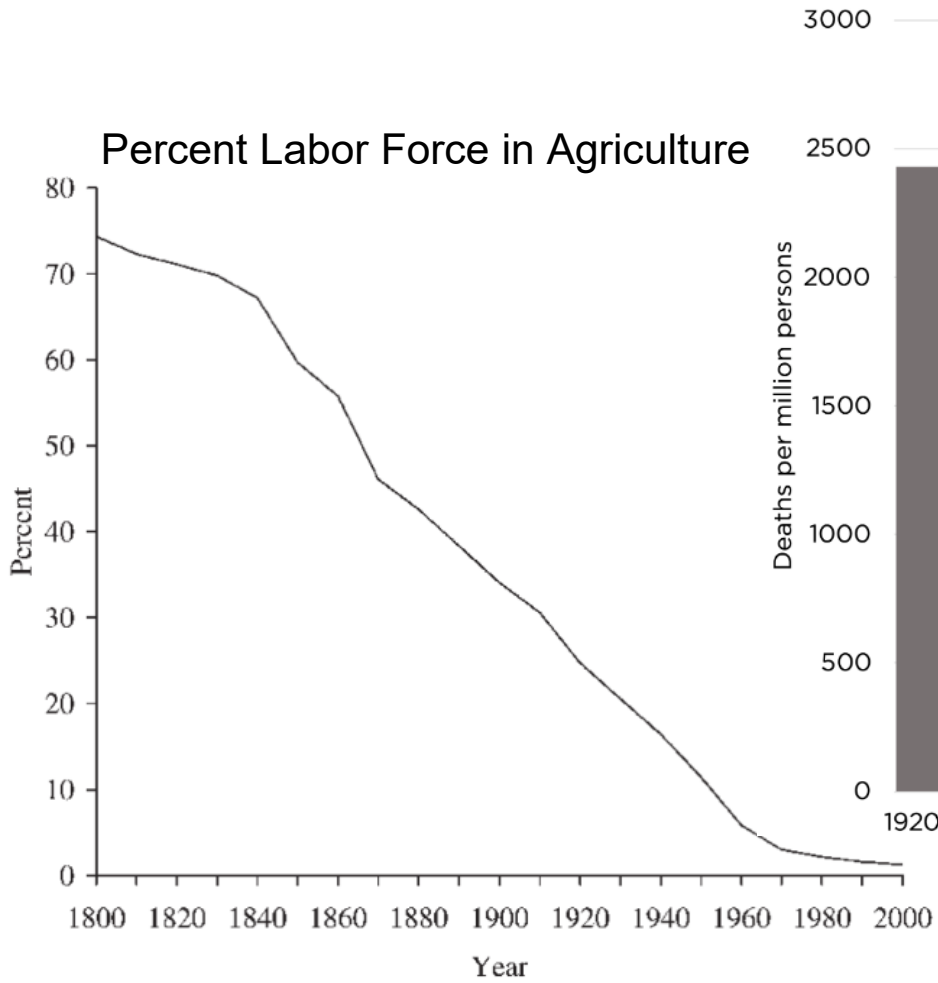
A World Without Technology Transportation



A World Without Technology Construction & Manufacturing



US Agriculture Employment, Climate Related Deaths & Life Expectancy at Birth During Period of Energy Growth



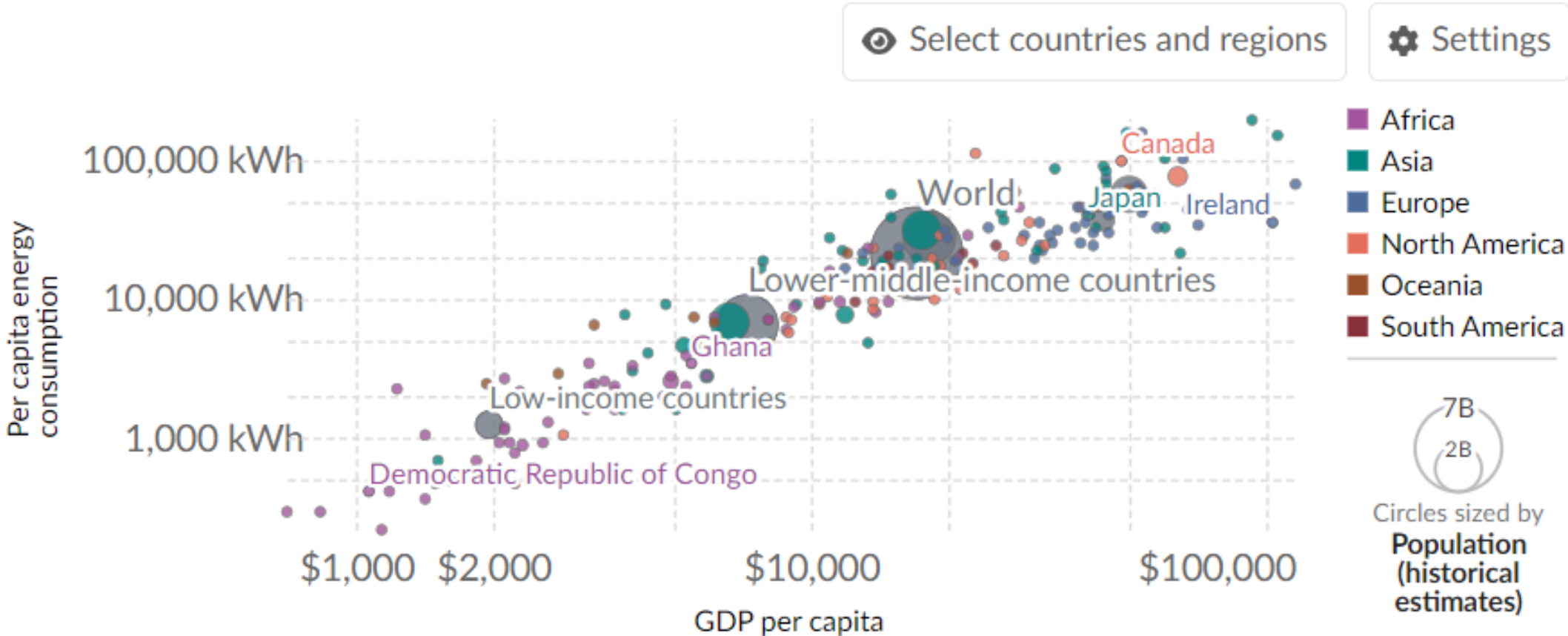
Data source: UN WPP (2022); HMD (2023); Zijdeman et al. (2015); Riley (2005)

Percent of the Labor Force Employed in Agriculture, United States, 1800 to 2000 Sources: Weiss 1992:22; Integrated Public Use Microdata Series: Version 3.0 (Ruggles et al. 2004).

Energy Drives Growth and Standard of Living



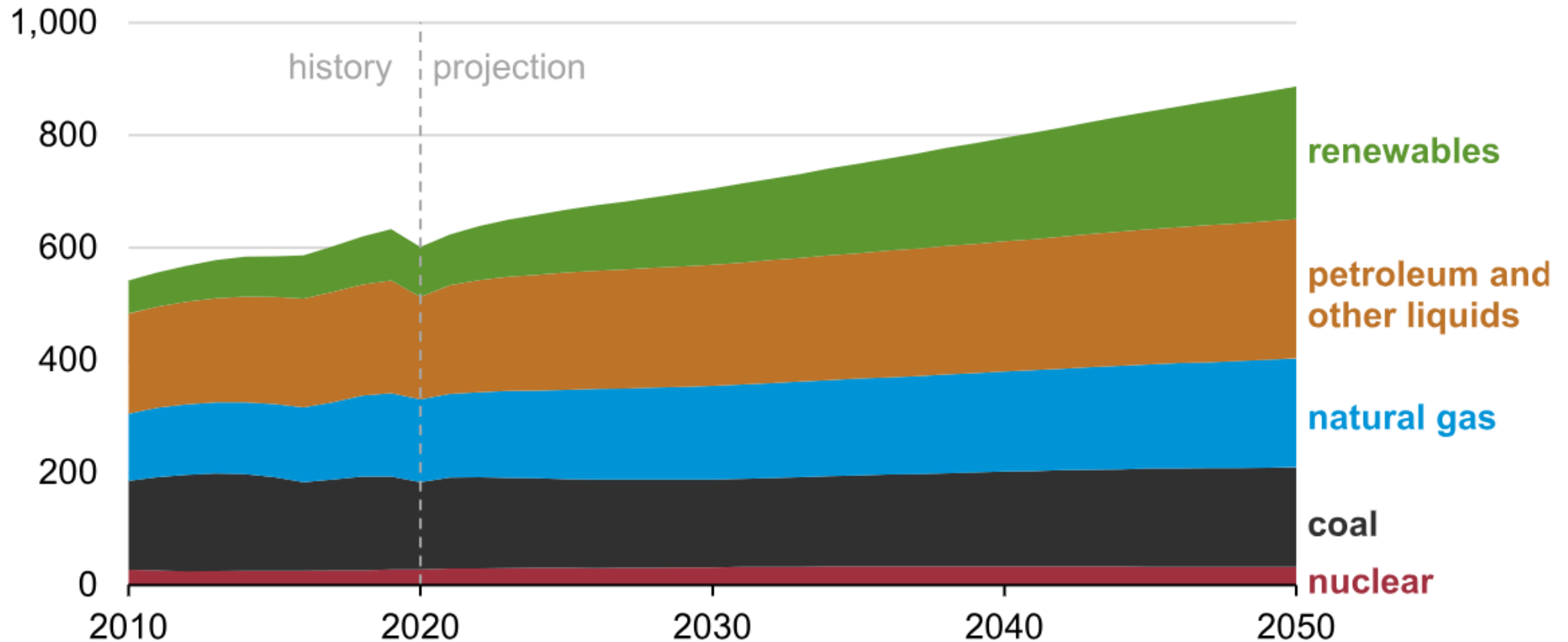
Energy refers to primary energy, measured in kilowatt-hours per person, using the substitution method.
Gross domestic product (GDP) is adjusted for inflation and differences in the cost of living between countries.



Data Source: U.S. Energy Information Administration (2023)

U.S. EIA projects nearly 50% increase in world energy use by 2050, led by growth in renewables with continued growth in fossil fuels

Global primary energy consumption by energy source (2010–2050)
quadrillion British thermal units



Source: U.S. Energy Information Administration, *International Energy Outlook 2021* Reference case

Note: Petroleum and other liquids includes biofuels.

What is Engineering?

Engineering is the application of science and math to solve problems.

While scientists and inventors come up with innovations, it is engineers who apply these discoveries to the real world.

- TWI Global

Engineering Is Everywhere Around Us



Areas of Engineering*

Environmental Engineer



Biomedical Engineer



Systems Engineer



Electrical Engineer

Chemical Engineer



Big Data Engineer



Nuclear Engineer



Aerospace Engineer

Computer Hardware Engineer



Petroleum Engineer



* Case Western Reserve University: <https://online-engineering.case.edu/blog/highest-paying-engineering-jobs>

Average Starting Salaries for B.S. Graduates



- Aerospace Engineering
\$76,875
- Architectural Engineering
\$66,788
- Biomedical Engineering
\$86,848
- Chemical Engineering
\$83,536
- Civil Engineering
\$70,326
- Computational Engineering
\$100,667
- Electrical and Computer Engineering
\$106,940
- Environmental Engineering
\$69,084
- Mechanical Engineering
\$82,737
- Petroleum and Geosystems Engineering
\$93,808

<https://cockrell.utexas.edu/student-life/career-services/salaries-and-statistics>

What Does it Take to be an Engineer



Curiosity - Engineers who are curious are interested in how things work.

Interest in STEM – Enjoy Science, Technology, Engineering, and Math subjects.

Critical Thinker – Like to work on complex problems that do not have simple solutions.

Logical Thinking – Ability to understand and work through complex systems.

Solving problems – Driven by innovating and being creative.

Teamwork and Communication – Like to work with others to tackle complex problems.

Benefits Of an Engineering Career

- Make the world a better place
- Creative Thinking
- Multiple career options
- Working with smart people
- Job satisfaction
- Challenging Work
- Protecting the public
- Respected profession
- Pride of improving peoples' lives
- Travel opportunities
- Intellectual Development
- Attractive earning potential
- Excitement of innovating
- Technological and Scientific Discovery

QUESTIONS?



Welcome to the

Mega STEM High School Event

at University of Houston

SPE GCC CSC

The Energy Transition – and the STEM carriers

STEM: science, technology, engineering, and mathematics

Introduction



Xaymaca
Bautista

<https://www.linkedin.com/in/xaymaca-bautista/>

I have over a decade of experience in the oil and gas and energy sector. My expertise focus mainly on the oil field service sector.

I hold a Bachelor's degree in Mechanical Engineering plus and extensive list of certifications relevant for the industry.

Additionally, I hold a Credential of Readiness in Business Management and Administration from Harvard Business School.



The purpose of this presentation is to inspire you to consider STEM careers in the oil and gas industry.

For it I want to highlighting the industry's role in the energy transition and the opportunities for innovation and impact in shaping a sustainable future.

Agenda

**Some Important
definitions**



**How long will the
Energy transition take?**



O&G Careers



**What does it mean for
Houston?**



What is Energy?

Energy is the ability to do work or the capacity to cause change.



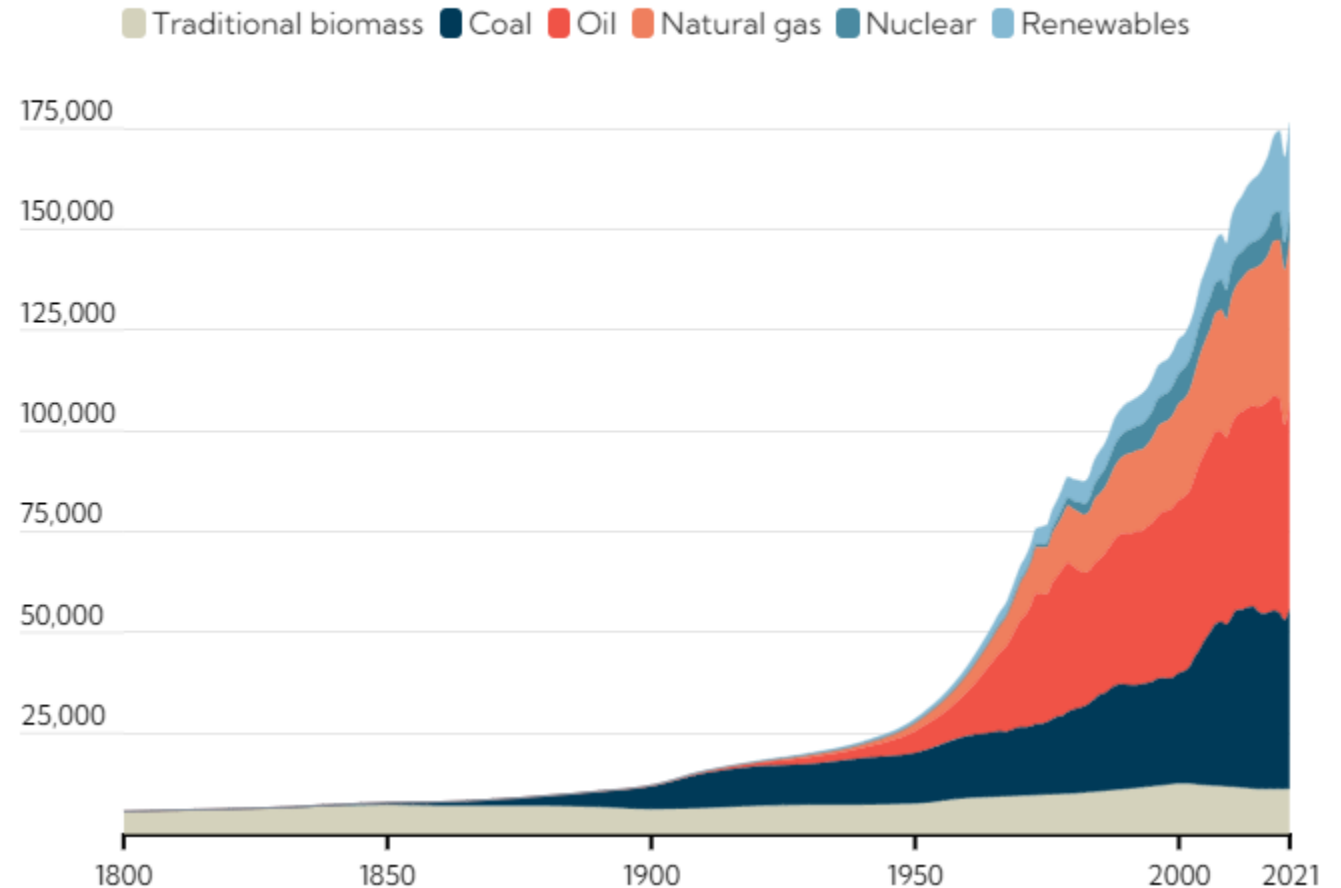
Reliably energy sources are a necessity for rising prosperity.

The Energy Mix

The energy mix refers to the combination of various primary energy sources used to meet energy needs in each geographic region. These sources contribute to the production of secondary energy for direct use, such as electricity*



Global primary energy consumption by source.
(terrawatt-hours)



Source: Our World in Data based on Vaclav Smil, Energy and Civilization: A History; and the BP Statistical Review of World Energy.
<https://www.imf.org/en/Publications/fandd/issues/2022/12/picture-this-energy-transitions>

Source: *https://en.wikipedia.org/wiki/Energy_mix

What is the Energy Transition?

It simple terms:

The energy transition is all about switching to cleaner energy sources and reducing pollution.

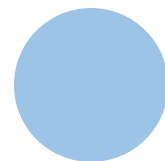
Explore this link to learn about an official term created by the United Nations:



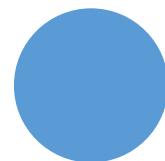
Image courtesy of: <https://www.imf.org>

What is the Energy Transition?

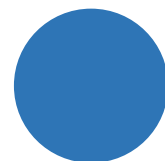
Depends...



Developed Countries: Transition from energy sources that produce greenhouse gases, such as methane and carbon dioxide, to cleaner forms of energy like wind and solar power.



Developing Countries: Transition from burning dung, wood, coal to using propane or cleaner energy sources, balancing the need for economic growth with environmental sustainability.



Additional Information: Two movies to watch starring Dr. Scott Tinker, State Geologist of Texas and Director of the Bureau of Economic Geology at UT Austin:

Switch: <https://switchon.org/films/switch>

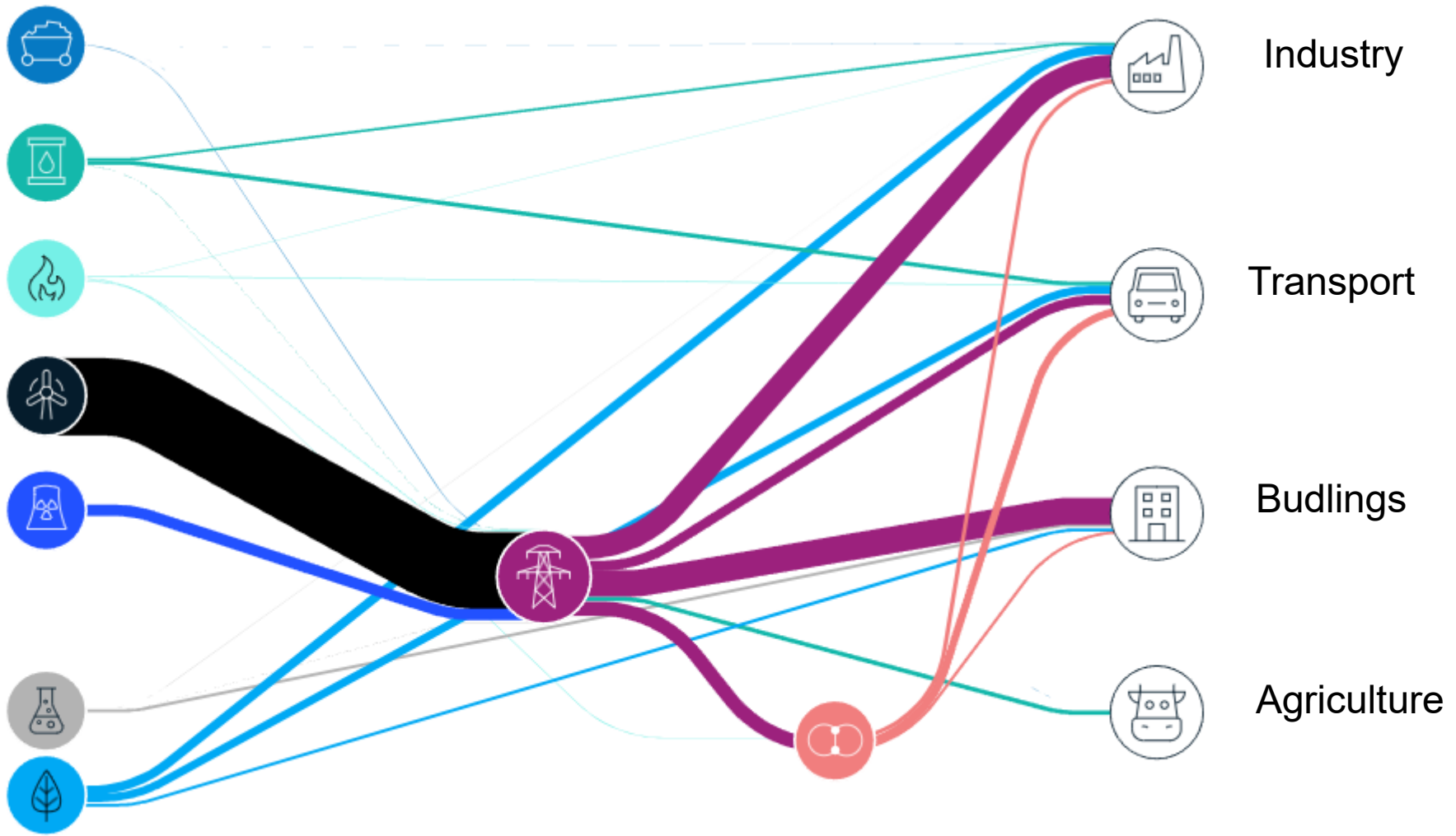
Switch On: <https://switchon.org/films/switch-on/>

How long will the transition take?

Net-zero Europe Decarbonization Pathway

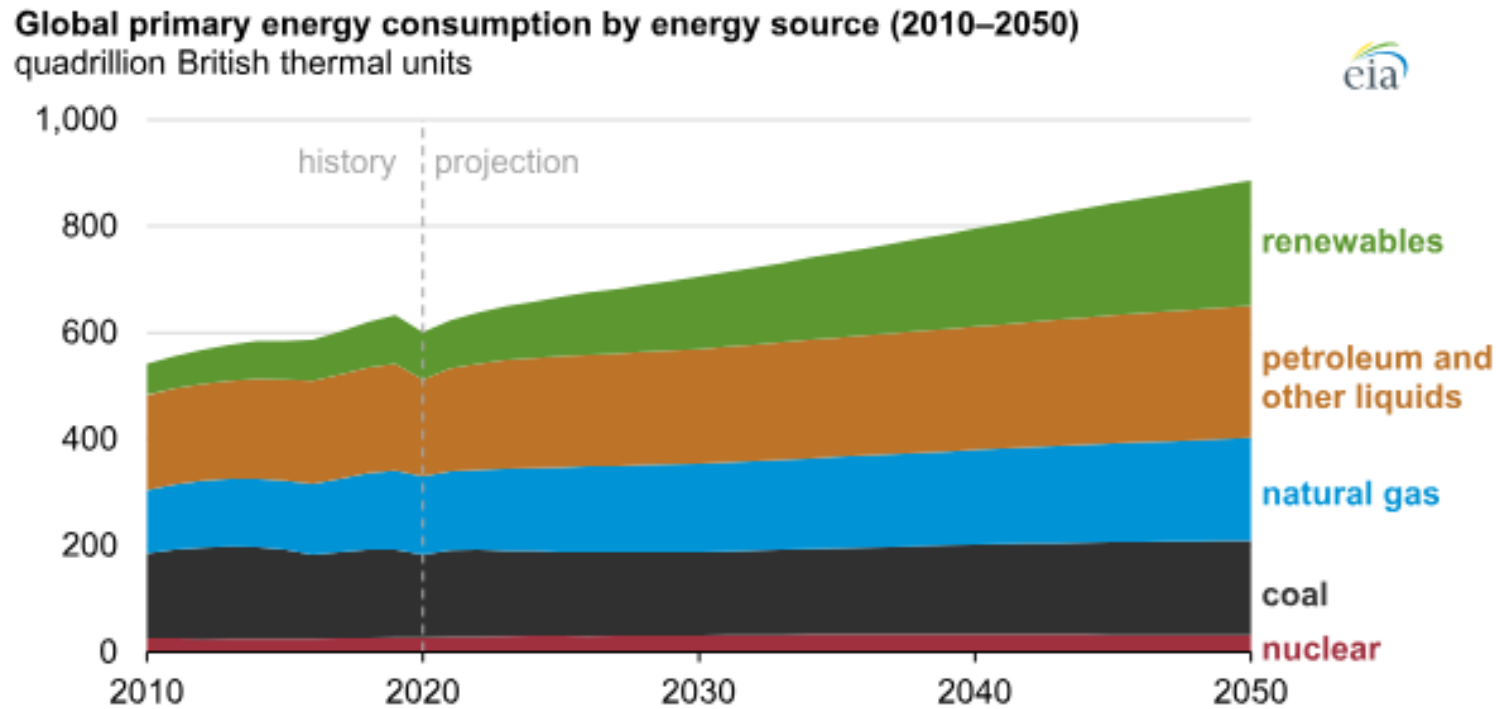
2050

- Renewables
- Bioenergy
- Nuclear
- Gas
- Oil
- Coal
- Power and heat
- Hydrogen
- Other¹



How long will the transition take?

Targets for achieving "carbon-neutrality" vary across industries and countries, but a common target year is 2050.



Source: U.S. Energy Information Administration, [International Energy Outlook 2021](#) Reference case

Energy Security:

Governments are realizing that the energy transition should ensure stable energy supplies to avoid economic problems and political issues

Economic disruptions:

Accelerating targets for net carbon emission reductions could create larger economic disruptions than anticipated, requiring careful consideration

North-South Divide: Rich and poor countries see the energy transition differently. Poor countries want to reduce pollution but also need energy for health, jobs, and growth.

Inspired on:
Bumps in the energy transition
Daniel yergin - December 2022. imf.org

O&G companies and the transition

Oil and gas companies are actively navigating the energy transition. Here are some key approaches they are taking.

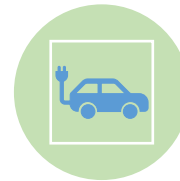
That demands



Investment in Renewables: Many are diversifying their portfolios by investing in renewable energy sources such as wind, solar, and hydropower.



Hydrogen Production and Transportation: Leveraging their long histories with hydrogen these companies are exploring hydrogen as a cleaner energy source.



Electric Vehicle (EV) Charging: Oil and gas players are entering the EV charging market.



Reduction of carbon footprint: This includes adopting technologies for carbon capture and storage (CCS), improving energy efficiency, and exploring alternative fuels

Source: <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/how-oil-and-gas-companies-can-be-successful-in-renewable-power>

OIL & GAS Careers

The oil and gas industry requires a range of professionals to support the energy transition. Here we list some key professional needed



**Petroleum
Engineers**



Geoscientists



**Environmental
Scientists**



**Chemical
Engineers**



**Mechanical
Engineers**



**Electrical
Engineer**



**Data Analysts
and Scientists**



**Renewable
Energy
Specialists**

What Does This Mean for Houston?



The Greater Houston Partnership (GHP) has a Houston Energy Transition Initiative that aims to keep Houston the Energy Capital of the World.

We have more than 600 exploration and production firms, 1,100 oilfield service companies and more than 180 pipeline transportation establishments in the Greater Houston area.

According to GHP, Houston could take a proactive role in the energy transition and gain up to 560,000 additional jobs. Houston is well-positioned to take advantage of this opportunity, potentially capturing \$35 billion annually (low side) and as much as \$210 billion annually (high side).

What Does This Mean for Houston?



Jane Stricker, Executive Director of Houston Energy Transition Initiative (HETI)

“We will be successful when we are recognized as a world leader in key technologies like CCUS, hydrogen, advanced plastics recycling, and energy storage, while also creating an environment that attracts and grows companies in all energy value chains.”



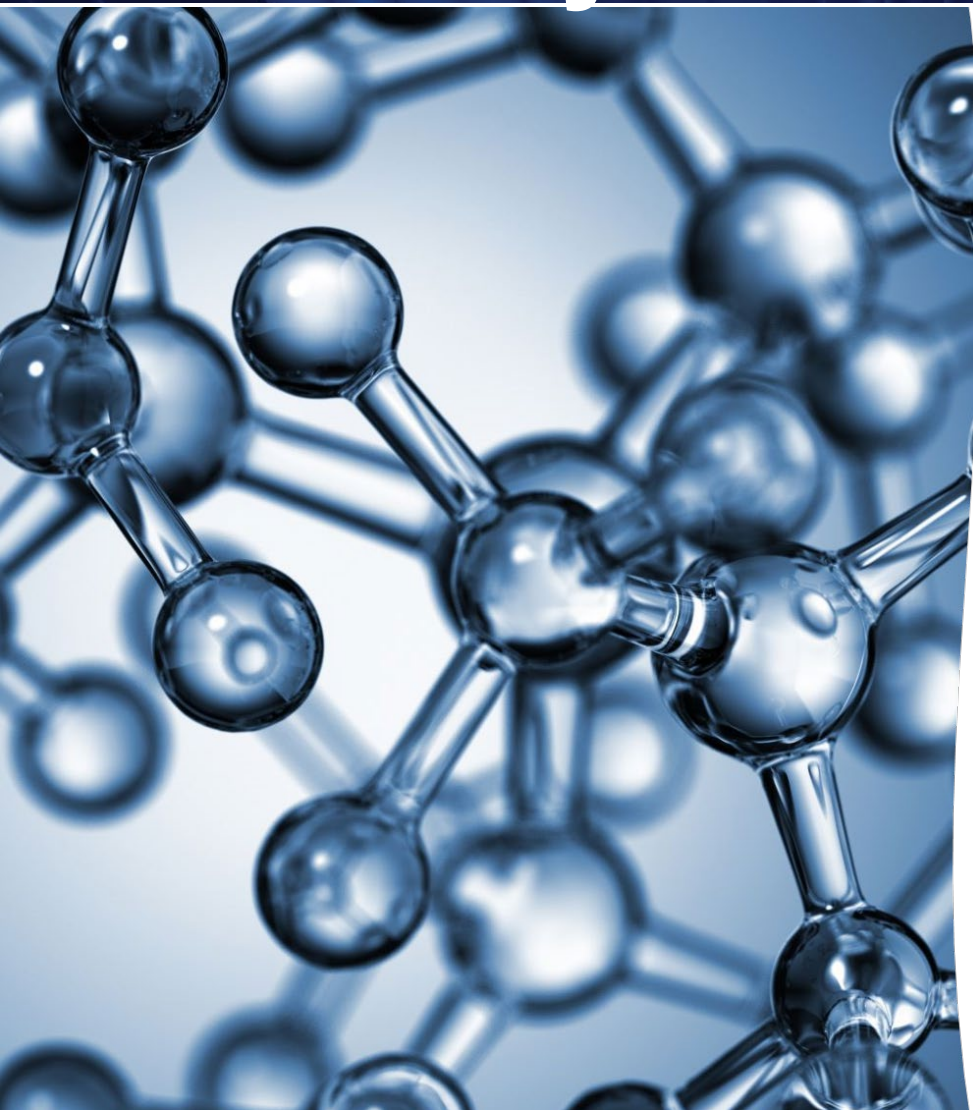
<https://htxenergytransition.org/>



Bobby Tudor, Chair of Houston Energy Transition Initiative and CEO of Artemis Energy Partners

“Two of Houston’s greatest strengths are its diversity and the willingness of Houstonians to come together to tackle big challenges. It is the combination of these strengths that will ensure our continued economic success through the transition.”

Takeaways



Energy is the lifeblood of prosperity, driving progress and powering our world.

However, the landscape is changing, and the oil and gas industry is evolving to meet the challenges of a rapidly changing world.

As we look to the future, STEM careers in the oil and gas industry will be more important than ever.*

STEM professionals will play a key role in shaping a better world, where reliable and clean energy is accessible to all.*

*These statements are forward-looking and reflect the presenter's assumptions and perspectives.



Society of Petroleum Engineers Gulf Coast Section

Scholarship and Scholarship Endowment Fund

April 6, 2024

Outline



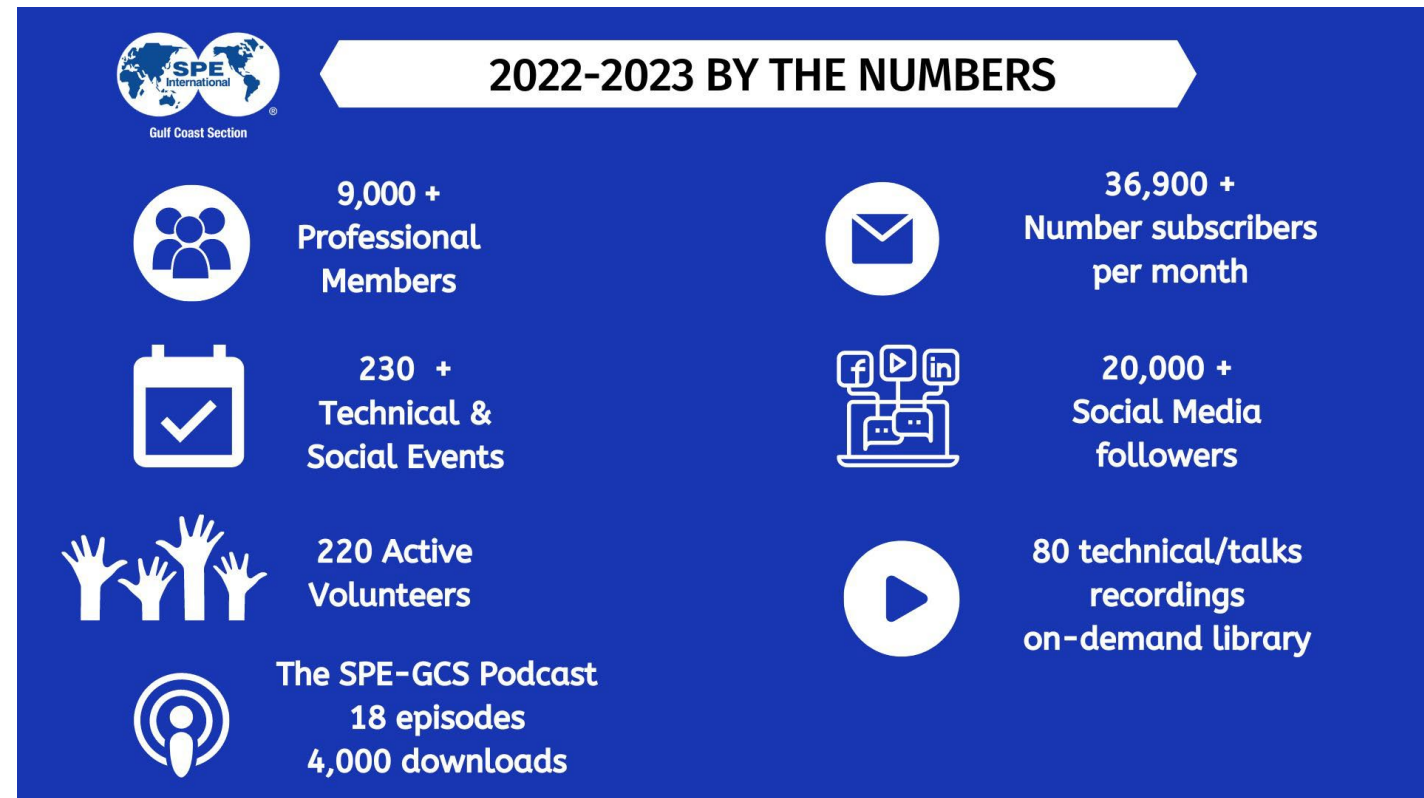
- Who We Are?
- SPE-GCS Supports Education
- Scholarship Application
 - Requirements
 - Recipient Selection Process
 - 2023 Scholarship Recipients

Who is the Society of Petroleum Engineers?



- A non-profit professional membership association
- Leading resource on technical knowledge and professional development in the energy industry
 - ~140,000 members who are engineers, scientists and managers
- Across 145 countries
- Achieve the mission through:
 - Meetings and exhibitions
 - Technical programs
 - Continuing education
 - Career management
 - Publications
 - Educational scholarships
 - Community services

SPE Gulf Coast Section



SPE-GCS Supports Education



Funding educational scholarships for over 50 years for promising local students entering the energy industry

\$5M

Scholarships Awarded

800

Sponsored Students

8-10

Merit based scholarships
awarded annually

38

Scholarship recipients currently

Scholarship Application Requirements



Gulf Coast Section

- Graduating high school senior
- Planning to study science, math or engineering as a freshman in college
- Planning to pursue a career in the energy industry
- Permanent residence address in one of the 29 counties in the Gulf Coast Section
- The GCS encompasses approximately 140 school districts and more than 300 high schools (public and private)



SPE-GCS SCHOLARSHIPS 
2024-2025

Questions or concerns:
gcsscholarship1@gmail.com

**Applications open
December 1, 2023**

**Applications are due
February 18, 2024**

The SPE-GCS Scholarship is for students pursuing a career in the energy industry. The scholarship is a renewable yearly scholarship, up to 4 years (\$2,000/semester, \$4,000/academic year). After the first year, students must meet certain requirements to remain eligible for subsequent scholarships (GPA, full time student, and major - details upon request).



Gulf Coast Section

TO APPLY FOR THE GULF COAST SECTION ANNUAL SCHOLARSHIP YOU MUST:

- BE A GRADUATING HIGH SCHOOL SENIOR
- BE PLANNING TO STUDY SCIENCE OR ENGINEERING AS A FRESHMAN IN COLLEGE AND HAVE AN INTEREST IN THE ENERGY INDUSTRY
- HAVE A PERMANENT ADDRESS IN ONE OF THE 29 COUNTIES IN THE GULF COAST SECTION
- BE A US CITIZEN OR PERMANENT RESIDENT

FOR MORE DETAILS:
WWW.SPEGCS.ORG/SCHOLARSHIP/
OR APPLY HERE:



Scholarship Recipient Selection Process



- The scholarship application covers several areas including: academics, extra-curricular activities, an essay on why the applicants have chosen a career in energy, and financial need plus letters of recommendation.
 - In 2024, received about 100 applications across 50+ high schools
- Each application is reviewed and scored by 3 committee members with top candidates (about twice the number of scholarships to be given) having a 30-minute interview with 3 different committee members.
 - In total, 30 volunteers reviewed the candidates
- A final ranking is done, based on the assessments of how committed they are to the energy industry and their applications, yielding the scholarship recipients.
- Winners are announced at the SPE-GCS Awards Banquet (Early August)

SPE-GCS Scholarship Recipients



Gulf Coast Section

2022



Jordan During
University of Pittsburgh
Mechanical Engineering



Griffin Binu
University Houston
Mechanical Engineering



Sophie Czelusta
Electrical & Computer Engineering



Abram Allen
Engineering



Grant Brewer
Petroleum Engineering



Joanne Tran
Boston University
Engineering



Olivia Rajagopal
Chemical Engineering



Kelly Shih
Mechanical Engineering

2023



Oscar Portillo
Mechanical Engineering



Oceana Misiaszek
Mechanical Engineering



Andrew Schwartz
Chemical Engineering



Daniel Capsimalis
Petroleum Engineering



Nathan Doiron
Mechanical Engineering



Emily Moore
Geology



Grace Roffall
Geology



Charles Gundrum
Petroleum Engineering



Ryan Buenger
Mechanical Engineering

