**Strategic Management in the Oil and Gas Industry**
**MANA 7373 - (Sec 15516) – Spring 2023**

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| **Section/Times:** | MANA 7373 - (Sec 15516) 6-9 PM - **MONDAY** (Virtual) |
| **Professor:** | Chris Angelides, Head of Energy Transition Program - Shell |
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**The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.**

## Learning Objectives:

The "Oil & Gas" industry is simultaneously at the peak of its century and a half history, and still coping with the effects of demand destruction from the Covid19 pandemic. It has never been larger, more productive and dispersed around the world, more technologically driven, and more important to the global, regional and local economies of nations; even while reeling in the short term due to the impact of the Russian invasion into Ukraine. It is nonetheless a significant factor in reducing or even eradicating global poverty, enabling improved nutrition and health, improving quality of life and longevity, with a litany of products and services that continue to expand based upon sustained research and development and customer applications. The price of Oil is an economic signal to the world of economic growth and political stability. The increased supply of Natural Gas changes power markets around the world bringing lower carbon dioxide fuel to electricity generation, displacing coal in many nations. Oil and Gas remain major geo-political gamechangers depending upon the global, regional, and local supply/demand balance. The broader energy industry is also a major developer of jobs across its entire operating range and its vast supply chain.

Simultaneously the Oil & Gas industry has never experienced greater threat to its growth, presence, participation in economic development and its future role in the world's economy in the face of global concern regarding climate change and global warming. The Oil & Gas industry is viewed by many political leaders, scientists, business leaders of other industries, and consumers from all sectors, industrial, commercial, retail, government and military, as harmful to the earth's biosphere in the way it currently operates. Its exploration, production, refining and marketing of products, transport, distribution, and storage in its current manner, despite its essential support of personal, freight, marine and aviation transportation, petrochemical products,

and power generation, are all viewed as prohibitive to addressing and resolving the existential threat of climate change in the 21st Century. In addition, the industry has failed to achieve a ratio of replacement to production and utilization better than one for a decade or more. This is likely to impact the industry substantially in the next fifteen to twenty years (and perhaps sooner) with demand tightening. Meanwhile the industry, together with the other fossil energy source, coal, provides more than 80% of the energy supplied to the world.

Some argue that the industry is or soon will be at peak production and that after a long plateau will begin to shrink as laws, regulations, alternative energy sources, changes in technology, consumer preferences, even affordability, drive the industry to shrink and ultimately to disappear. Others maintain that Oil & Gas are essential to contemporary and future society and that its future is secure as an additional one and a half billion people on earth are moved from energy poverty to energy availability and that the unique nature of its strengths and value creating products are critical to humankind and the global economy. They also maintain that there are technological improvements that are becoming increasingly available to achieve both net carbon pollution neutrality and later net carbon pollution reduction, achieving or bettering the ambitions of the Paris Global Climate Accords of 2015 within this century provided the right leadership and political will prevail.

**Strategic Management in the Oil & Gas Industry** will examine the complexities, contradictions, dichotomies, and conundrums that the future holds for this currently essential natural resource. It will do so by focusing on the following topical aspects of the industry, presented in interrogatory form.

- Is the industry properly structured for the continued supply of Oil & Gas to the global economy in ways that deliver available, affordable and increasingly sustainable future energy? Will changes coming from the demand side of the oil and gas future define the industry differently? How might changing demand impact the full supply chain and what are the implications?
- How do supply/demand, efficiency, environment, and infrastructure interact and relate to one another in the normal operations of the industry and is their integration appropriately understood by all stakeholders across the industry from investors to producers, from politicians and government officials, from scientists and academics to the consumers of the products of the oil and gas industry?
- Is the governance of energy and more specifically of Oil & Gas adequate to judge and determine based upon all the variables available a realistic and judicious pathway of laws, regulations, best practices, application of technology, facilitation of infrastructure and regulation of environmental impacts on land, water and air to enable the industry to operate and prosper for positive impact on the global economy and society and the biosphere?
- How do democracies and authoritarian systems of governance rationalize or justify the futures of oil and gas within the operating parameters and conditions of their respective operating methods, laws, regulations, customs, economies, and does the balance of power

and enablers vs disablers work among the executive, legislative and judicial branches of the disparate systems?

- Are the technologies and practices utilized across the industry sustainable and affordable and most of all fit for purpose to meet the needs of industry and its investors, given the future anticipated threats? Does the industry adequately quantify risk and mitigate against risk of various kinds, but especially low probability high impact events?
- Is the leadership of the industry and are its multiple levels of management and staff adequately informed, educated and sufficiently well led to fully address the needs of the business as it currently operates and to simultaneously take the industry into the future?
- How does the mix of energy alternatives and their availability, affordability and sustainability impact the future of energy supply vs demand, the technologies that deliver them, and the economic, social, and political environments in which we live?
- How does the industry sustain the affiliation of investors and financial firms that supply the ongoing capital and cash requirements of a capital intensive industry and under what terms and conditions given the demands of the market for more supply, the need for new technologies, the challenges of operations in the various geographic regions of the globe, the uncertainties of environmental rules, the pressures of political and other business leadership and the support or resistance of society and consumers from all sectors? Are the ESG demands of investors satisfied by the industry's current environmental performance and its plans for the environmental future?
- To what extent do oil and gas companies' and the industry's reputation largely writ, the public knowledge and education of society, political opinions of leaders, elite populations, and the reality of public policies impact the oil and gas industry's way forward and also enable and protect the economic impact of the millions of jobs associated with the industry's operations and its vast supply chain.
- The oil and gas industry has over its history and particularly in the past two decades been transformed/disrupted by technology developments that were largely unanticipated. What are the possible future disruptors, technological innovations that could make the difference to an industry that sees itself as adapting to and contributing to the requirements and solutions as articulated in the Paris Accords of 2015?
- How does carbon management or carbon as a business impact the future of oil and gas? Is the future outlook for carbon management a genuine and real business unto itself, capable of achieving the net carbon neutral or net negative carbon impact that it potentially promises? Or is carbon management an exercise in massive public relations and distortion of inevitable scientific facts that fossil fuels are simply incompatible with the future of society and the earth? With an obvious requirement for deep decarbonization central to the future of the industry, how do appropriate strategies towards integration of renewables and alternate feed stock impact the future as part of carbon management?
- How do geopolitics help or hurt the future of the oil and gas industry under both current and future operating expectations?
- What are the chances of the Energy Transition of the 21$^{st}$ Century actually occurring short of imposition by government authority, by competent and adequate technological

changes developed and implemented by the industry on its own merits and profitability, from the outcomes of global conflict, winner decides, or because the potential for global prosperity and peace enables successful outcomes?

**List of discussion/lecture topics**

1/23 - Week One – Consideration of the industry structure for oil and gas ranging from a review of integrated majors to independents; upstream, downstream, midstream, chemicals, gas and power, trading, shipping, oil field services, oil field equipment, contractor services, technical research and development, industry associations, functional organizations: finance, legal, human resources, information management, outsourcers, independent finance specialists, banks, think tanks, etc. Review of demand side changes. Review of entirety of supply chain. Economic impacts of oil and gas industry.

1/30 - Week Two – Integration of oil and gas subsystems of supply/demand, efficiency, environmental compliance, infrastructure (hard and soft). Significance of integration relative to stakeholder community, including suppliers, customers from all sectors, investors, scientific community, academics, elected and appointed officials, etc. Consideration of the ratio of reserve replacement to production and utilization and how the industry will shift from the past decade of less than one to a higher ratio.

2/6 - Week Three – The governance of energy and how it works for oil and gas, including laws, regulations, best practices. Assessing the effectiveness of governance as it relates to energy prosperity or energy poverty. Addressing the future of governance of energy for the energy transition of the 21st Century.

2/13 - Week Four – Oil and gas industry operations and futures in democratic and authoritarian states. Differences in systems and processes. Governmental enablers vs mandates vs disablers. Protocols, agreements, negotiations, range or extent of support to non-support.

2/20 - Week Five – The role and types of technologies across the industry from upstream to downstream to midstream to chemicals. Impacts and opportunities for Information Management, Artificial Intelligence, Blockchain, industry digitization. Sourcing and outsourcing capability and implications.

2/27 - Week Six – Human capability in the oil and gas industry from leadership to executive management to boards of directors, all layers of management and staff. The significance of NIH (not invented here) in large, medium and small organizations compared with the continuous learning and influencers of external organizations, such as think tanks, consultants, academics, et.al. Efficiency and Effectiveness of organization structures, processes, performance metrics. Security and rewards.

3/6 - Week Seven – The availability and sources of alternative supplies that compete with oil and gas. The significance and importance of energy density, power density, regional requirements. The recognition and implications of intermittency and storage capacity in the design and performance on an energy system. Alternative modes of transportation energy, battery electric and hydrogen fuel cell, and implications for transportation sectors of personal, freight, marine and aviation transportation, and petrochemicals. The importance of strategies towards integration of renewables and alternate feed stocks to aid in the deep decarbonization needs of the industry.

(NOTE: 3/13 – SPRING BREAK)

3/20 - Week Eight – Investment community perspectives of oil and gas. The risks of decapitalization and/or loss of banking capacity and adequate financing. Implications for industry structure and companies in the future. Availability of funding for new technology and implications for supply chain, employment, economic disparities across industries.

3/27 - Week Nine – Reputation and Risk Management and implications for industry and companies. Awareness and knowledge of the industry among critical elites and the general public and risks of lack of awareness and knowledge. Remedies for public involvement in the energy transition. Mid-term exam due at start of class.

4/3 - Week Ten – Recent experiences with technology disruptors and implications for the industry. The potential for future disruptors and the opportunity for the eradication of energy poverty. Quantifying risk and mitigating against risk of various kinds, but especially low probability high impact events/opportunities.

4/10 - Week Eleven – The future of carbon management or carbon as a business and the potential for net zero carbon neutrality and net negative carbon neutrality. A realistic assessment of the technologies, financing, pathways to progress, governance and time requirements. A realistic assessment of outcomes as public relations vs quantification and monetization of strategy and execution/operations.

4/17 - Week Twelve – Geopolitics and the future of oil and gas relative to the global and regional markets. Differentiators in the manner by which geopolitics matter, or don't. Implications of geopolitics on the global economy, environment, climate, international conflicts and industry outlook and stability.

4/24 - Week Thirteen – Full assessment of the likelihood of a successful 21st Century oil and gas energy transition and the roles of industry leadership and own resources vs government mandate-led transition. Implications for investors, business performance, employee value propositions, stakeholder and customer relations, availability, affordability and sustainability.

(Guest Speaker – TBD)

5/1 - Week Fourteen – Final papers and final exam due by end of class.

**Required Reading**

Shell's Sky Scenario - Shell website

Yergin, Daniel: ***The New Map****: **Energy, Climate, and the Clash of Nations*** – Penguin Random House 2020

**Additional Readings:**

Detailed reading list will be provided with required and optional readings.

**Major Assignments/Exams Grading**

Each student's final numerical score for the course is based on the following items and weights:

Mid-term exam: 25%

Final exam: 25%

Final paper:25%

Class attendance/participation/discussion/special topic reports (Deep Dives): 25%

**Academic Honesty:**

The University of Houston Academic Honesty Policy is strictly enforced by the C.T. Bauer College of Business. No violations of this policy will be tolerated in this course. A discussion of the policy is included in the University of Houston Student Handbook, which can be found at http://www.uh.edu/dos/hdbk/acad/achonpol.html . Students are expected to be familiar with this policy.

**COVID-19 Information**
Students are encouraged to visit the University's COVID-19 website for important information including diagnosis and symptom protocols, testing, vaccine information, and post-exposure guidance. Please check the website throughout the semester for updates. Consult the (select: Undergraduate Excused Absence Policy or Graduate Excused Absence Policy) for information regarding excused absences due to medical reasons.

**Reasonable Academic Adjustments/Auxiliary Aids**
The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact the Justin Dart Jr. Student Accessibility Center (formerly the Justin Dart, Jr. Center for Students with DisABILITIES).

**Excused Absence Policy**
Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

**Recording of Class**
Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

**Resources for Online Learning**
The University of Houston is committed to student success, and provides information to optimize the online learning experience through our Power-On website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, Blackboard, and Canvas; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact UHOnline@uh.edu.

**UH Email**
Please check and use your Cougarnet email for communications related to this course. To access this email, login to your Microsoft 365 account with your Cougarnet credentials.

**Webcams**
Access to a webcam is required for students participating remotely in this course. Webcams must be turned on during class during class participation and discussion.

**Academic Honesty Policy**
High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

**Title IX/Sexual Misconduct**
Per the UHS Sexual Misconduct Policy, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/.

**Security Escorts and Cougar Ride**
UHPD continually works with the University community to make the campus a safe place to learn, work, and live. Our Security escort service is designed for the community members who have safety concerns and would like to have a Security Officer walk with them, for their safety, as they make their way across campus. Based on availability either a UHPD Security Officer or Police Officer will escort students, faculty, and staff to locations beginning and ending on campus. If you feel that you need a Security Officer to walk with you for your safety please call 713-743-3333. Arrangements may be made for special needs.

Parking and Transportation Services also offers a late-night, on-demand shuttle service called Cougar Ride that provides rides to and from all on-campus shuttle stops, as well as the MD Anderson Library, Cougar Village/Moody Towers and the UH Technology Bridge. Rides can be requested through the UH Go app. Days and hours of operation can be found at https://uh.edu/af-university-services/parking/cougar-ride/.

**Syllabus Changes**
Please note that the instructor may need to make modifications to the course syllabus. Notice of such changes will be announced as quickly as possible through (*specify how students will be notified of changes*).

## Course Evaluations

The Bauer College of Business has a policy that requires all of its instructors to be evaluated by their students. The results of these evaluations are important to provide feedback to instructors on how their performance can be improved. We openly encourage students to provide feedback to the instructors and the Bauer College of Business through the evaluation process.

## UH Caps

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps<http://www.uh.edu/caps>) by calling 713 743 5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program (http://www.uh.edu/caps/outreach/lets_talk.html ), a drop-in consultation service at convenient locations and hours around campus.

## BlackBoard Learn

Blackboard Learn will be used in this class as a course management tool. To access Blackboard, please obtain a Blackboard ID and login at **http://www.uh.edu/blackboard.** If you have questions about Blackboard or need technical assistance, you can click on the "get help" link on the Blackboard website, call the help-line at 713 743 1411 (M-F 8AM -8PM), or visit the IT Support Center in room 56 of the library (M-F 8AM – 8PM). Contact me for any course-related questions.

## Classroom Civility

As students enrolled in courses offered by the Bauer College, you are expected to adhere to the ethical principles described in the Bauer Code of Ethics and Professional Conduct (Bauer Code), in addition to those required by the UH Student Handbook. You may review the Bauer Code by clicking on the following link – http://www.bauer.uh.edu/BCBE/BauerCode.htm. You may obtain a copy of the UH Student Handbook from the Dean of Student's Office located in room 252 of the University Center, or by visiting the publications webpage on the Dean of Student's website at http://www.uh.edu/dos/pub.html . Students are expected to conduct themselves as follows:

- Timely arrivals and departures – It is expected that you arrive (or log in) on time.
- Attention during class – It is expected that you provide your full attention during class. This means that you should avoid using your computer to surf the internet, play games, or check email; read newspapers or magazines; or other activities not directly related to the classroom instruction.

- Unauthorized use of cell phones or beepers during class – Please turn your cell phones and beepers off before coming to class (or logging in). If you find it necessary to keep your phone turned on, please put it on the vibrate mode.
- Respect for Other Students – Everyone is encouraged to participate in class discussion. While doing so, it is important to allow everyone to fully express his or her opinion. The classroom environment must be operated in a manner that encourages full participation from each student.
- Preparation for Class – You are expected to prepare for class by reading all assignments. Your preparation will show by the quality of your questions and comments.
- Harassment – Making harassing or obscene comments or gestures to other students, faculty, or staff members will not be tolerated. This includes sending harassing or obscene email or voice messages to other Bauer students, faculty or staff.

**Helpful Information**

**Coogs Care**: https://uh.edu/dsa/coogscare/

**Student Health Center**: https://www.uh.edu/healthcenter/