Chevron

John S. Watson
Chairman and Chief Executive Officer

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Via Email Delivery – [redacted]@npc.org

Mr. Marshall Nichols
Executive Director
National Petroleum Council
[redacted]
Washington, DC 20006

Dear Marshall,

In response to Rex Tillerson's August 25 request for potential study topics, I am enclosing a list of suggestions. You will find that they build on previous work undertaken by the Council and are very relevant to the issues highlighted by Secretary Moniz at the July meeting.

Underpinning our list is the fact that affordable and reliable energy drives economic growth and improved living standards at home and abroad. As we work toward discovering and developing the fuels of the future, we should also ensure our policies and regulations are not stifling progress in developing and improving existing forms of energy. The Council's balanced, fact-based recommendations are needed more than ever as we strive to simultaneously address the environmental, economic and security challenges we face.

I look forward to supporting your efforts on this important work.

Sincerely,

Enclosure

Chevron Corporation
[redacted]
[redacted]@chevron.com

1. Importance of U.S. Oil and Gas

With U.S. oil and gas resources abundant and vital to U.S. economic, security and environmental goals, what can be done to address the above ground risks threatening continued development?

In the current low-cost environment, deferred investment creates risk of shortage and price volatility in several years if new supply is inadequate to meet demand growth and decline of existing sources. How would above ground factors, including increased regulatory cost or reduced access, impact the timing and severity of this outcome and U.S. competitiveness? Considerations include:

- How will current levels of capital investment impact the supply demand balance in the medium term?
- Update on resiliency and outlook for tight oil and gas resources, factoring in knowledge gained in the past several years
- Update on current state of regulation, industry practice, and safety/environmental performance. Much has changed in this regard since the 2011 *Prudent Development* report and accurate assessment of current state would enable a more balanced discussion of progress and remaining gaps
- How will the policy environment including new regulations impact investment and development in the U.S.?
- Long-term access to broad range of resources offshore and onshore
- Impact on U.S. economic and climate change objectives
- Risk of reduced U.S. production and market share, and associated balance of payments and foreign policy implications
- Updated specific recommendations to maximize prudent development and necessary infrastructure investment

2. Managing Energy Transitions

What are the potential implications of shifting the U.S. to a lower carbon footprint energy future and the critical items to be considered for managing the transition to ensure energy security, affordability and reliability, while maintaining economic competitiveness for the U.S.?

Even with the focus on decarbonization and an eventual shift to future energy technologies, oil and gas will continue to remain critical in the global fuel mix for decades. A greater understanding of potential challenges in the transition path would help to inform energy policy. In particular, it is essential to recognize that technology to achieve deep decarbonization is not yet available at scale and the next few decades will require practical application and improvement of existing technologies, including oil and gas, to ensure the transition occurs in a cost effective way that doesn't undermine competitiveness of the U.S. economy. Considerations include:

- Comprehensive cost of carbon regulation and transparency of carbon policy economic impacts
- Technology and cost breakthrough hurdles
- Infrastructure needs
- Realistic discussion of scale and timeframe

- Adaptations or shifts in business models for other industries (e.g. power, autos)
- Employment and trade flow implications
- Investment required to maintain viable oil and gas industry

3. Infrastructure

What level and type of infrastructure is needed to capitalize on existing technology to simultaneously address economic, energy and security challenges?

Natural gas, along with renewables and efficiency, has contributed to reduction in U.S. GHG emissions over the past several years. Gas remains an indispensable tool to further reduce GHG emissions in a scalable and economic manner in the coming decades. Full utilization of natural gas is limited by infrastructure, as demonstrated by the lack of pipeline capacity to serve the Northeastern states. Similarly, infrastructure will be needed to ensure efficient development of oil resources given fundamental changes in the oil landscape. Considerations include:

- Projection of infrastructure needs to take advantage of the abundant U.S. oil and gas resource domestically and through export
- Policy recommendations to streamline deployment and encourage the necessary capital investment

What is needed to ensure continued reliability and security of critical U.S. oil and gas infrastructure?

Oil and gas infrastructure developed over a century of experience has reached a high level of reliability. With the need for this infrastructure to remain viable and secure for decades, what is needed to enhance the system to address 21st century risks? Considerations should include:

- Cyber security
- Investment in asset integrity
- Adaptations to address future sea level rise for coastal facilities
- Transportation questions, such as the right mix of pipeline versus rail

4. America's Transportation Future - Personal Mobility Addendum

What are the most impactful changes in the personal mobility landscape?

Since the 2012 report *Advancing Technology for America's Transportation Future*, the personal mobility landscape has been shifting quickly. Autonomous vehicle technology development has accelerated, on-demand ride hailing is becoming ubiquitous, and consumer behavior is shifting.

This study would highlight the most impactful changes in the personal mobility landscape and quantify their potential effects on the previous outlooks for infrastructure challenges, vehicle miles travelled, fuel shares and consumption, vehicle ownership, fleet composition and efficiency, and emissions. Considerations could also include impacts on U.S. refining demand and exports of U.S. crude and products.