

What's Happening in Energy: Trends and Future Outlook

- Introduction
 - **Sue Gander**, Division Director, NGA Center
- Speaker:
 - **Stanley Porter**, Vice Chairman and Energy, Resources & Industrials (ER&I) Industry Leader, Deloitte



**2019 Oil, Gas & Chemicals; Power & Utilities;
and Renewable Energy Outlooks**

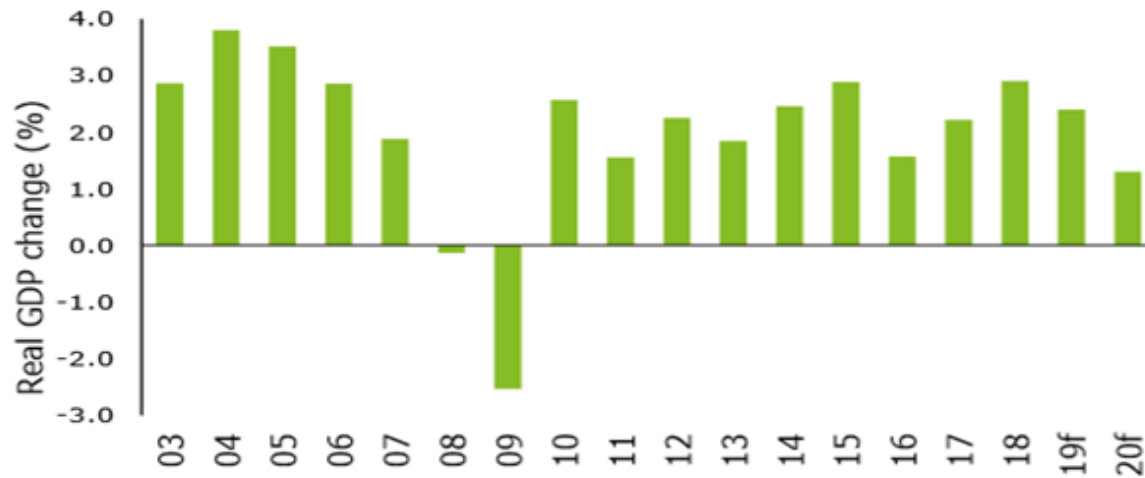
Stanley Porter, Vice Chairman and US Energy, Resources & Industrials leader

July 2019

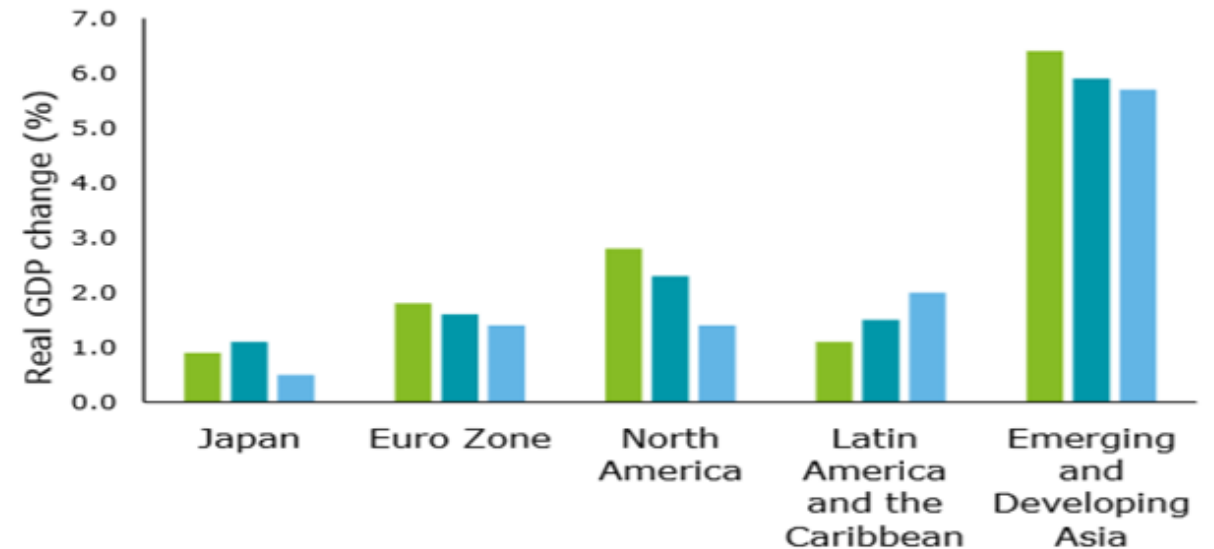
US economic expansion is now in its 10th year

Forecasters are moderating the near-term growth outlook

US real GDP, annual percent change (2003-2020)



Regional real GDP, annual percent change (2018-2020)



Key risks and long-term structural forces

- **Populism:** less support of evidence-based policy
- **Nationalism:** protectionism and international institutional framework under threat
- **Globalization:** integrated global economy to persist, but growth in trade volumes declining and more on-shoring
- **Technical change:** comparative advantages are lost quick, adoption of technology varied across firms, increase in market concentration, labor market disruption
- **Productivity Paradox:** Incredibly technology advances but productivity slowdown in the advanced countries
- **Demographics:** slower labor force growth, labor shortages, skills shortages, increased diversity in market and employees
- **Climate Change:** More severe weather events

Oil and gas outlook is mixed, but fundamentals remain solid

Economic headwinds and geopolitics may offset promising market fundamentals

Global Markets



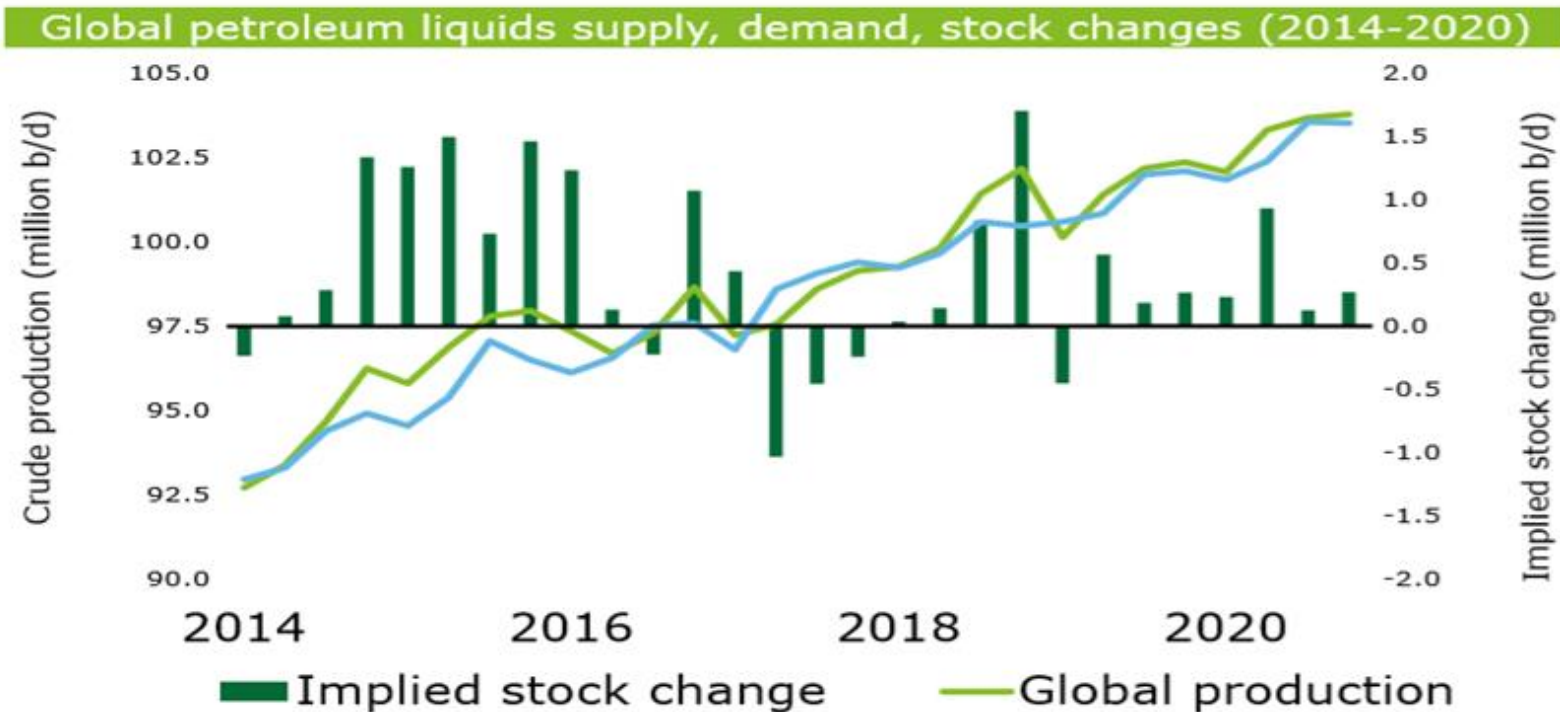
- OPEC oil production fell from December 2018 - March 2019, but has increased since to ~30.3 million b/d
- The 14 OPEC members have exhibited wide variability in production levels, with Iran and Angola's production falling offset by significant rises in Nigeria and Iraq and recoveries in crisis-torn Libya and Venezuela.
- But geopolitics, trade and tariffs pose near-term risks to economic and energy price outlook
 - Threat of war with Iran has the potential to cause a massive oil "price shock"
 - Chinese tariff retaliation threatens US Energy exports
 - Confrontation in Venezuela and Libya set to continue

North America Markets



- US oil, LNG export buildout takes shape on Gulf Coast
 - By early 2020, US Gulf Coast crude export capacity could approach 8.5 million b/d, and US LNG export capacity stands to climb above 7 bcf/d
 - US crude exports to reach 3.5 million barrels per day by the end of the year and average 4.5 million bbl/d in 2020
- China's tariff retaliation could blunt US LNG export growth momentum
 - On May 13, China raised tariffs on imports of LNG from the US to 25% from 10%, effective June 1, 2019.
 - Market participants have reported several resales or diversions of US origin cargoes from China to other Northeast Asia countries

Global petroleum stocks expected to build modestly through 2020

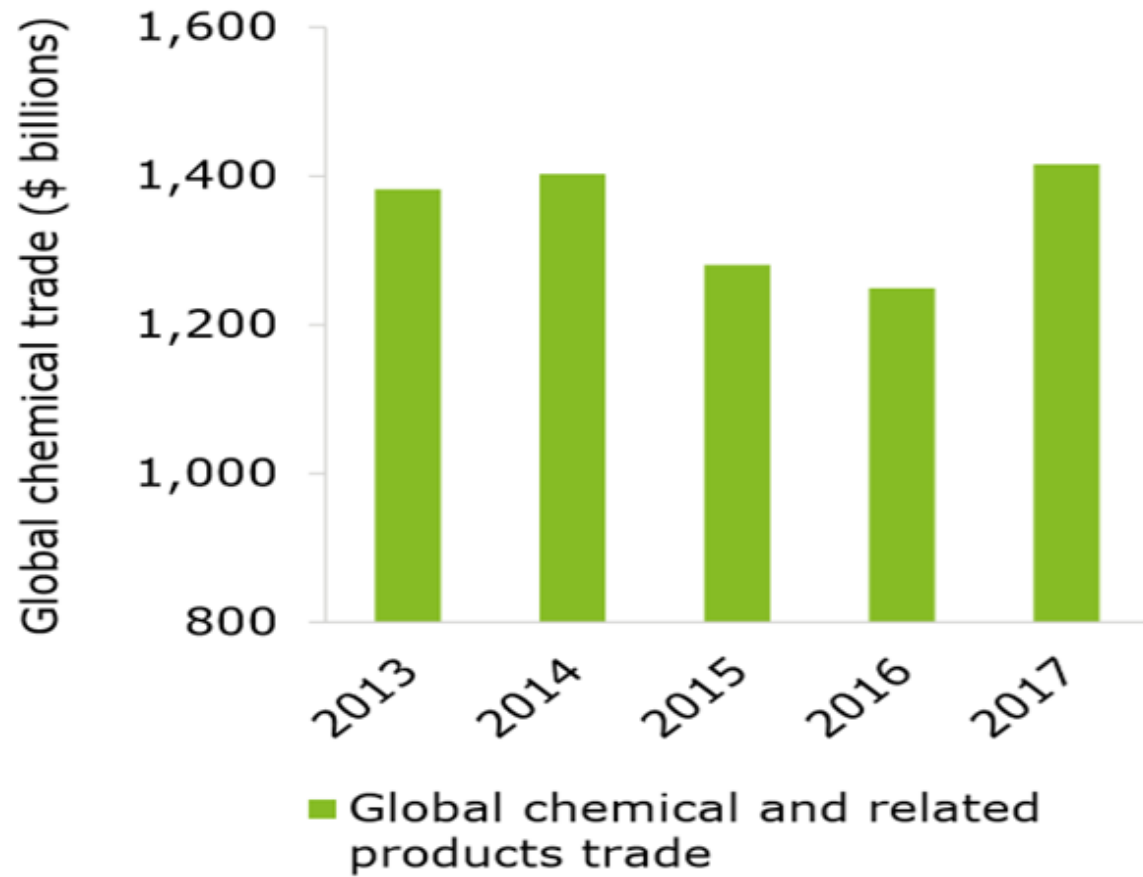


- Global petroleum stocks rose rapidly through 2016 following OPEC's decision not to cut production
- Stock levels neared 5-year average in 2017, but outlook is mixed due to continued US production growth
- Growing production and elevated stock levels will continue to weigh on prices through 2020

Source: Deloitte analysis, Energy Information Administration Short-term Energy Outlook, April 9, 2019

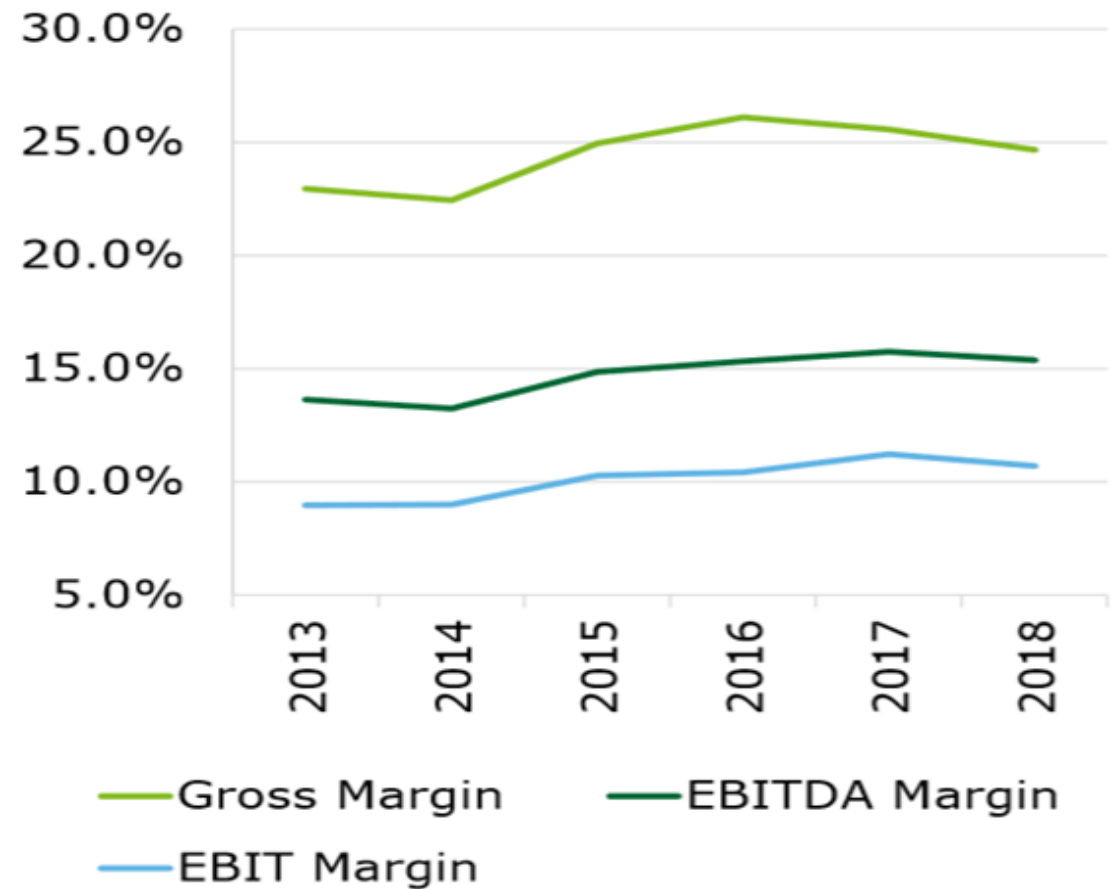
Note: Petroleum production, consumption and stocks include all liquids fuels such as crude oil and products of petroleum refining, natural gas liquids, biofuels, and liquids derived from other hydrocarbon sources

Chemicals margins showing a slight downward trend with the trade picture being mixed



Source: American Chemistry Council, 2018 Elements of the Business of Chemistry

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Source: CapIQ, Deloitte analysis

Companies aspire to close the product lifecycle loop, but the circular economy remains challenging



Chemicals companies can be part of the solution here

Automotive:

Government targets to reduce CO2 emissions and increase the fuel economy of vehicles, have led to higher incorporation of 'lightweight' chemicals and materials in new vehicles

Construction:

as companies strive to make buildings 'smarter,' they also are trying to incorporate 'greener' construction materials

Packaging:

There is a trend towards making packaging materials biodegradable and re-usable.

Power & utilities:

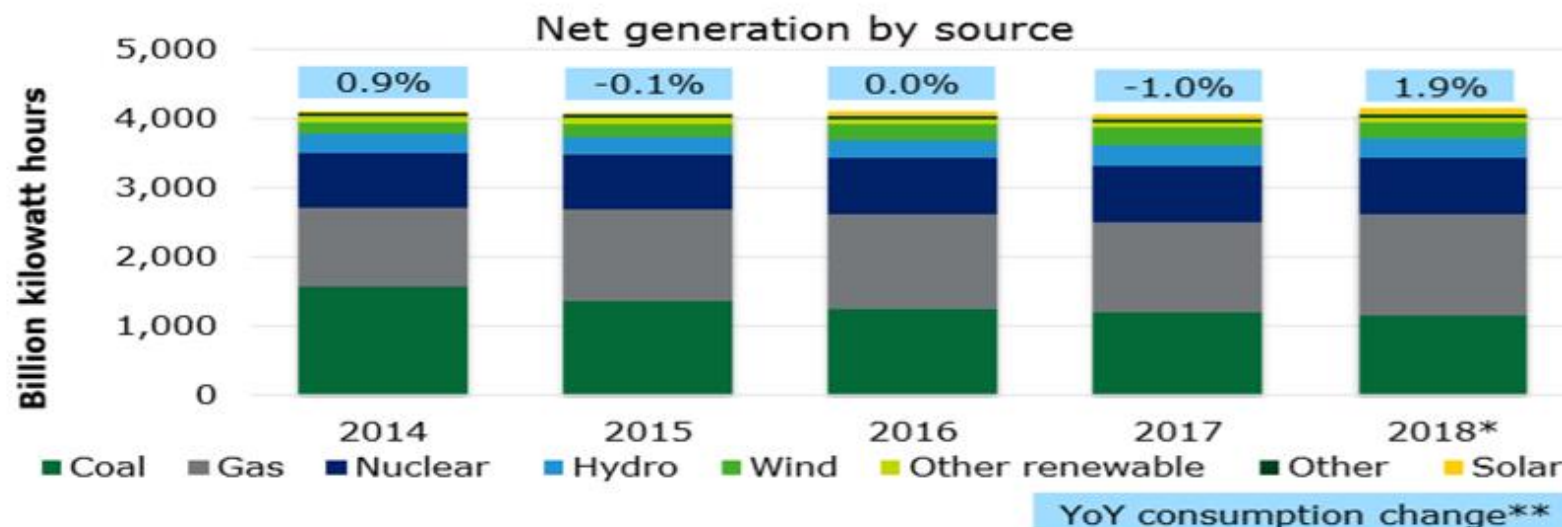
Higher growth of renewable energy resources like solar and wind, is leading to greater production of solar cell materials and higher use of composites in wind turbine blades

The role of chemicals and materials is extending well beyond their current functionalities

US electricity consumption still growing slowly; generation coming from increasingly clean sources

The move to lower carbon sources continues:

- Displacement of coal-fired generation
- Steady growth in natural gas fired generation
- Rapid growth in wind and solar



* data through October 2018 from U.S. Energy Information Administration Electricity Monthly Update, December 26, 2018.
* represented by retail sales for electricity, includes direct use

Renewable energy growth likely to continue due to strong fundamentals and three enabling trends



Fundamentals:

- Robust demand
- Declining costs
- Falling costs of battery storage

Enabling trends:

- Emerging policies
- Expanding investor interest
- Advancing technologies



High-tech digital experiences across industries have become the “new normal” and electricity customers are seeking more choice

Power companies are responding with innovations that give customers more control over energy usage

Real-time appliance management

Multi-channel customer notifications

Distributed energy resources control (e.g., energy storage)

Real-time supplier switching

Dynamic tariffs

Peer-to-peer community-based market

Real-time outage recovery updates

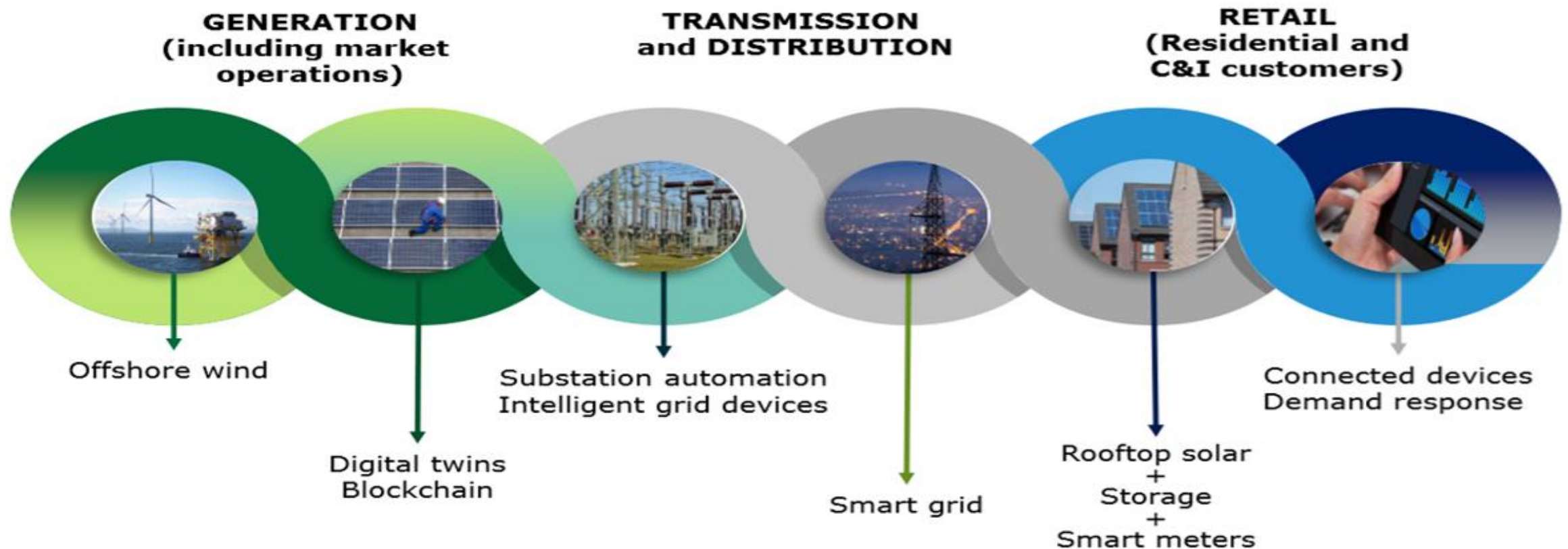
Personalized bundled services- meter, electricity, energy usage tips

Flexible modes of bill payment



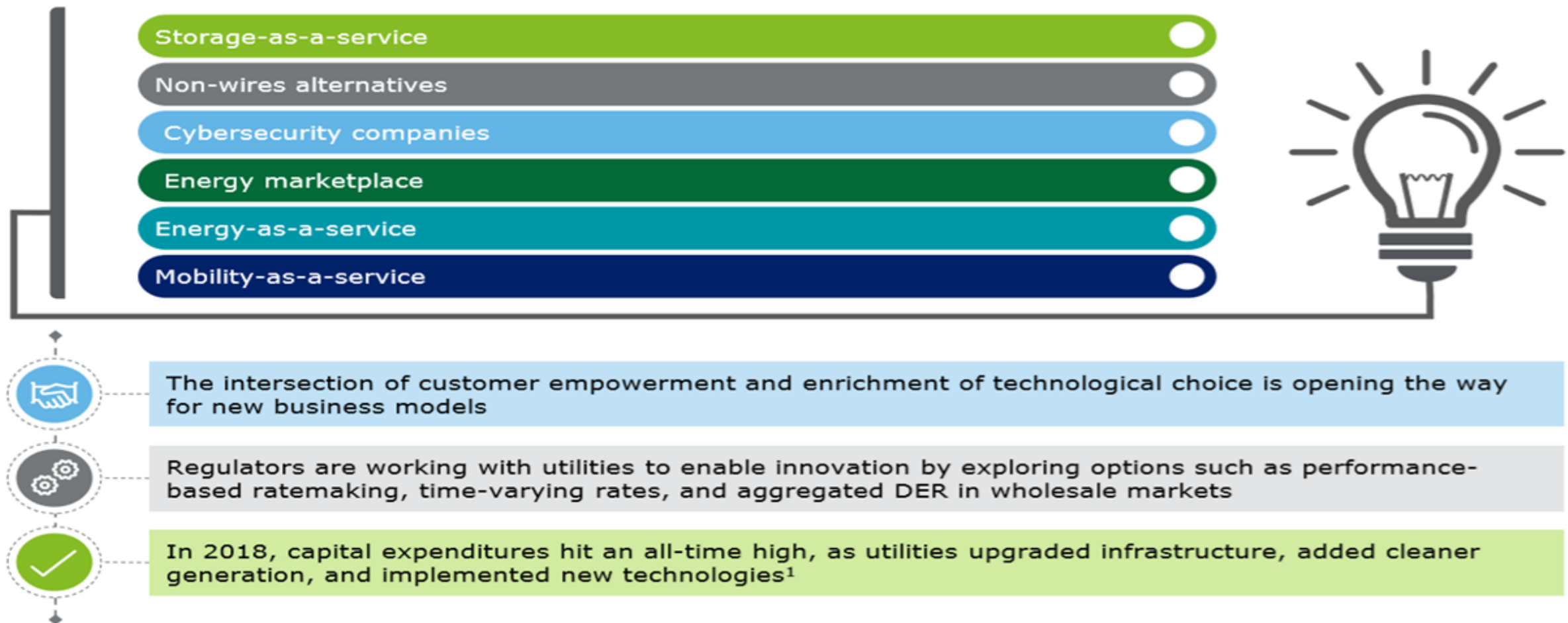
1. Energy management system
2. Solar panels
3. Smart meter
4. Smart inverter
5. Storage battery
6. House breaker panel

Technology is enabling digital transformation across the electricity value chain



The wealth of opportunities digitization provides to improve operations suggests power companies should move technological awareness and strategic thinking to the core of planning and management

New business model opportunities are emerging for power companies, while regulatory change strives to keep pace and costs remain high



¹RRA and SNL Energy, "RRA Capital Expenditure Update," October, 2018. SNL Energy's RRA index includes 50 of the largest publicly traded U.S. electric and gas companies. RRA and SNL Energy are offerings of S&P Global Market Intelligence