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A Journey Into the Future
2017 Strategy

Inflation and population since 1000

US comes off Gold Standard        Fiat Currency

Historical Timeline by century of inflation/deflation

Industrial Revolution        Tech Revolution

Inflation Age        Deflation Age
2017 Strategy

That was then, this is now

Opportunity to reinvent before the exponential change or hyperbolic stage

The too late stage
2017 Strategy

It took the internet 10 years to reach 1 billion users.

Uber to 2 years to accomplish 1 billion rides and one more year to capture another billion.
2017 Strategy

Ride Shares are like Internet in 2000 against retailers

![Graph showing global oil production, consumption, and ride shares over time.](image-url)
How many years did it take for an invention to be used by 25% of the American population

Networks have changed everything

![Graph showing the years it took for various inventions to be used by 25% of the American population.](image)

- Electricity: 46 years
- Telephone: 35 years
- Radio: 31 years
- Television: 26 years
- Computer: 16 years
- Mobile Phone: 13 years
- Web: 7 years
- Smart Phones: 0.08 years (Pokemon Go - 1 month - 100 MM user)
It took the internet 10 years to reach 1 billion users.

The Good-to-Great Study

It took each “great company” 15 years to figure out their business.
2017 Strategy

Good to Great Principles - Three Stages of Breakthrough

- Disciplined People
  - Level 5 leader
  - Right people on bus, first who then what

- Disciplined Thought
  - Confront the brutal facts
  - Hedgehog concept

- Disciplined Action
  - Culture of Discipline
  - Technology accelerators
Fortune 1000 over the past 40 years

1975 - 1985
- 30% had fallen off the list

1985 - 2015
- 70% had fallen off the list

Fortune 1000 over the next 20 years
2015 - 2035
- 70% will fall off the list
### 2017 Strategy

#### US Demand Disruptions

- **Ride Share / Autonomous Cars**
  - 60%  5.66

- **Food / Oil Demand on Trucks**
  - 25%  0.9525

- **Naphtha Demand – Plastics Auto**
  - 50%  0.11

- **Asphalt Demand – Parking Lots**
  - 50%  0.65

#### US Demand Loss

- **7.37**
Network Economy Brings Abundance of the following:

- Transport Gasoline, Distillate Fuel, Asphalt, Plastics, Rubber, Steel
- Food
- Services
- Commercial and Residential Real Estate
2017 Strategy

Ride Shares and Oil Demand and Virtual Transport

Stage 1: Industrial Growth
Stage 2: Networked Transport
Stage 3: AR and MR, Virtual Transport, Holoporation
The Future is here for the auto industry
2017 Economy

Major US City Commute Patterns – Current System
2017 Economy

Autonomous Car Technology
- Google's self driving car project in California and Texas
- Google's Chief Legal Officer was forced off Uber Board for conflict of interest
- Google's self driving fleet will be ready by 2020 with un-named manufacturer
- Google's launches "Waymo" self driving project under Alphabet
- Google's partners with Chrysler in MiniVan ride share service
- Uber completed $680 MM acquisition of Otto the self driving truck company
- Uber completed $300MM JV with Volvo to develop autonomous cars
- Uber secured a strategic investment with Toyota to develop autonomous cars
- Uber states all Uber cars will be driverless by 2030
- Volkswagen invests in a new transport company MOIA to redefine transport
- Ford Targets fully autonomous vehicles by 2021
- GM acquired Side Car as a competitor to Uber and Lyft; 2020 is GM forecast
- Delphi announces self driving system by 2019
- Tesla announces self driving system by 2018
Autonomous Car Technology – Is it safe?

Media
- Tesla has self driving fatality – June 2016

Fact’s
- MIT has drones flying 30 – 50 MPH through wooded forest without incident – 15/16
- US auto accident rate is 10% per year; self driving will pull this under 0.5%
- Current 38,300 Auto Fatalities per year will drop significantly
- Current 6,019,000 Auto crashes per year will drop significantly
We did not have a MPG problem, we had a network structure problem
Because the units could not communicate we did not have a commodity
Wireless has unitized the automobile space
2017 Economy

2016 Current System

2020 - 2040 Future System
Hub and spoke model is near at hand - 10 Destination Model simplified

- Short Haul – Cars
- Medium Haul - Bus, Train
- Long Haul - Plane, Bus, Train

- Network of N Nodes bounded n-1

- Un-Networked model requires 45 routes (current waste)
2017 Economy

Network Curve for Oil and Gas

Commuting Alone by Car

Commuting by Public Transit

Bubble size represents number of workers. This bubble = 500,000

- New York City
- Washington, DC
- San Francisco
- Boston
- Philadelphia
- Baltimore
- Seattle
- Dallas
- Houston
- San Antonio
- San Diego
- Las Vegas
- Charlotte
- Memphis
- Columbus
- Nashville
- Fort Worth
- El Paso
- Jacksonville
- Indianapolis
- Oklahoma City
- Miami
- Austin
- Denver
- Portland
- Milwaukee
- Los Angeles
- Oklahoma City (See inset to the right)
Network Curve for Oil and Gas Demand ~4 MM lower than Exxon Case
What in industries will this effect? One of the largest deflationary stories the world has seen thus far

- Oil and Gas: 25% to 50% reduction from Exxon case
- Automobiles: 40% - 60% reduction in the US
- Insurance: 80% reduction in the US
- Steel, rubber, plastics, ethylene: 20% reduction
- Labor productivity: 10% improvement
- Freight: 10% improvement
How do BP and Exxon compare the future (both ~ 63 MM BBL/day):

How does this change with a reduction in the Auto fleet and network riding?
Strategic Recommendations
2017 Strategy

Stage 1

Divest Logistics Asset Co

Stage 2

Reduce to OpCo

Stage 3

Create Technology Logistics Flywheels

Rebuild as Global Technology based Logistics Company

Distribute Logistics Assets
Industrial Revolution to Tech Economy
Innovation in America – Forthcoming rate of change
Assumptions on Oil from Majors
Human Fertility Rates

- Africa: Growth
- Asia, Latin America, Europe, U.S.: Lower
Population growth
2017 Economy

Population growth - Forecast

Current Population 2016

India’s mortality has become a recent problem with the spike in sewage issues.
BP Energy Demand Forecast

Energy intensity and energy demand

Decline in world energy intensity

<table>
<thead>
<tr>
<th>% per annum</th>
<th>0%</th>
<th>-1%</th>
<th>-2%</th>
<th>-3%</th>
<th>-4%</th>
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<td>1965-2014</td>
<td>1%</td>
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<td>1994-2014</td>
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<td>Base case</td>
<td>-2%</td>
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<td>-4%</td>
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<tr>
<td>2014-35</td>
<td>-3%</td>
<td>-4%</td>
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<tr>
<td>Flat demand</td>
<td>-4%</td>
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</table>

Fastest 20-year average

World energy demand

World Demand Sensitivity

<table>
<thead>
<tr>
<th>Billion toe</th>
<th>1965-2014</th>
<th>1994-2014</th>
<th>Base case</th>
<th>Flat demand</th>
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<tr>
<td>0</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
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<tr>
<td>1965</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
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<tr>
<td>2035</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>
BP Energy Demand Forecast
BP Energy Supply Forecast – Note the Meteoric changes; demand will be greater
BP Energy Supply Forecast

Ten year supply increments:

Tight oil

Shale gas

- S & C America
- Middle East
- Europe & Eurasia
- Africa
- Asia Pacific
- North America

2017 Economy
BP Energy Supply Forecast
2017 Economy

BP Energy Demand Forecast

**Liquids fuel demand by sector**

- Transport
- Industry
- Other
- Power

**Vehicle fleet**

- Non-OECD
- OECD

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Exxon Energy Demand Forecast

OECD 32 570 Autos per 1,000
Undeveloped 100 Autos per 1,000
2016 1 Billion light duty Vehicles

2040 Exxon expects 1.8 Billion light duty Vehicles

2040 Exxon expects 45 MPG compared to 25 MPG today
Exxon’s Projections

**Transportation - projections**

- Global transportation demand (MBDOE)
  - Commercial
  - Light-duty road

- Transportation demand by region (MBDOE)
  - OECD32
  - China
  - India
  - Key Growth
  - Rest of World
Exxon’s breakout
Exxon’s breakout

Transportation – projections

Light-duty vehicle demand trends

- United States
- Key Growth
- China
- Europe OECD
- Asia Pacific OECD

Light-duty vehicle fleet by region

- Millions
- 2000
- 2010
- 2020
- 2040

Light-duty vehicles and motorcycles

- Billions
- 2000
- 2010
- 2020
- 2040

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Exxon’s breakout

Light-duty vehicle fleet by type

- Electric/PHEV*/fuel cell
- Hybrids
- Natural gas/LPG
- Diesel
- Gasoline

*Plug-in hybrid electric vehicles

Global vehicle fuel efficiency

- Average mpg
- Average liters per 100 kilometers

Fuel economy
Consumption
Exxon Supply Assumptions

Liquids - projections

Liquids supply by type

Technology-driven supplies

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General Economy
Total US Debt (Corporate + Government + Household) / US GDP
Current Ratio is $61.1 Trillion Debt / $16.5 Trillion GDP = 370%
June 2016 Data - Federal Reserve

US leaves Gold Standard 1971
Trade weighted US Dollar Index of Major currencies index includes the Euro Area, Canada, Japan, United Kingdom, Switzerland, Australia, and Sweden.

Source: Board of Governors of the Federal Reserve System (US)
2017 Economy

Home prices

Case Shiller index

- Phoenix - AZ
- Los Angeles
- San Diego
- San Francisco
- Denver
- Washington
- Miami
- Tampa - FL
- Atlanta - GA
- Chicago
- Boston
- Detroit - MI
- Minneapolis - MN
- Charlotte - NC
- Las Vegas
- New York
- Cleveland - OH
- Portland - OR
- Dallas - TX
- Seattle - WA
- Composite
- Composite 20
Home prices – Texas real estate move higher has been unprecedented
2017 Economy

30 Year Fixed Mortgage Rates (Blue line)

Mortgage Rate

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# 2017 Economy

## Global Growth Rates

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<td><strong>OECO Demand</strong></td>
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<tr>
<td>Americas</td>
<td>2.8</td>
<td>2.4</td>
<td>2.1</td>
<td>0.5</td>
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<tr>
<td>Europe</td>
<td>1.1</td>
<td>1.5</td>
<td>1.7</td>
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<td>Asia Oceania</td>
<td>1.7</td>
<td>1.0</td>
<td>0.6</td>
<td>0.7</td>
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<td>Total OECD</td>
<td>2.2</td>
<td>2.7</td>
<td>1.46</td>
<td>1.33</td>
<td>1.33</td>
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<tr>
<td><strong>NON-OECO Demand</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>FSU</td>
<td>2</td>
<td>-3.4</td>
<td>-1.8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Europe</td>
<td>2.8</td>
<td>2.9</td>
<td>1.7</td>
<td>1.6</td>
<td>1.6</td>
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<tr>
<td>China</td>
<td>7.5</td>
<td>6.7</td>
<td>6.2</td>
<td>6.2</td>
<td>6.2</td>
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<tr>
<td>Other Asia (India, etc)</td>
<td>5.4</td>
<td>6.4</td>
<td>7.3</td>
<td>7</td>
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<tr>
<td>Latin America</td>
<td>3</td>
<td>0.5</td>
<td>-0.8</td>
<td>1</td>
<td>1.5</td>
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<tr>
<td>Middle East</td>
<td>3.3</td>
<td>2.6</td>
<td>1</td>
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<td>Africa</td>
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<td>4.4</td>
<td>3.3</td>
<td>4</td>
<td>4.8</td>
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<tr>
<td>Total Non-OECO</td>
<td>5.1</td>
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<td>2.41</td>
<td>3.11</td>
<td>3.45</td>
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<td><strong>Vantage Total Demand</strong></td>
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<td>2</td>
<td>2.1</td>
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<tr>
<td><strong>IMF World (latest)</strong></td>
<td>3.4</td>
<td>3.3</td>
<td>3.2</td>
<td>3.5</td>
<td>3.9</td>
</tr>
</tbody>
</table>
2017 Price of Oil

![Graph of Brent Crude Oil Price (2014-2017)]

- **Vantage Forecast (April 2014)**
- **Vantage Forecast (May 2017)**
- **NYMEX (April 7, 2014)**
- **NYMEX December 27th, 2016**
Super Major of the Future – a Strawman case

- All rigs autonomous by 2022
- Cutting ex-pat pay and eliminating 90% of ex-pats
- Eliminate travel through virtual travel and augmented reality
- Cut personnel costs by 50%
- Drilling decisions all reliant on big data – eliminate subjectivity
Oil Markets – Frac Sand Data
Permian Detail
Frac sand data has really made a significant turn in the past 9 months in the Permian.
Eagle Ford Detail
Frac Sand Examples – Eagle Ford (increasing production – half cycle)
Bakken – Williston Detail
Frac Sand Examples – Bakken (Production stabilizing to higher)
Frac Sand Examples – Bakken (Production stabilizing to higher)
## 2017 Oil Production by Basin

<table>
<thead>
<tr>
<th>Basin</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oklahoma – Granite Wash - Mississippian</td>
<td></td>
</tr>
</tbody>
</table>
Frac Sand Examples – Mississippian (Production in decline)
Frac Sand Examples – Mississippian (Production in Decline)
Kansas - Mississippian
Frac Sand Examples – Mississippian (Production in decline)
Frac Sand Examples – Mississippian (production in decline)
2017 Oil Production by Basin

Rockies – Wyoming – Utah - Colorado
2017 Oil Production by Basin

Frac Sand Examples – DJ Basin (Production stabilizing to higher)
2017 Oil Production by Basin

Vantage Total DJ Niobrara Production Model compared to EIA

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2017 Oil Production by Basin

Utica - Ohio
2017 Oil Production by Basin

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2017 Oil Production by Basin

Vantage Total Utica Production Model compared to EIA

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