

10 REASONS TO LOVE OIL & GAS EXPLAINED:

THE MODERN WORLD IS NOT POSSIBLE WITHOUT OIL & GAS. TOGETHER WITH DRAMATIC ADVANCES IN HUMAN LIBERTY, THE MASS PRODUCTION OF OIL AND GAS HAS IMPROVED THE HUMAN CONDITION IN WAYS THAT WOULD HAVE BEEN SIMPLY UNIMAGINABLE TO OUR ANCESTORS.

- 1. DOUBLED HUMAN LIFE EXPECTANCY:** Worldwide life expectancy at birth is estimated to have been between 30 and 35 years in 1859 (the first oil well was drilled in 1859). In 2016, the World Health Organization estimates worldwide life expectancy at birth of 72 years, while it is currently increasing by about 3 years per decade. More than a doubling since our industry began only 160 years ago!
- 2. REDUCED GLOBAL EXTREME POVERTY:** Using Bourguignon and Morrison estimate, in 1860, 91% of the world population lived in absolute poverty -- less than \$2 per day in today's dollars. Today, the World Bank estimates 10% of the global population lives in extreme poverty. If you use the even lower bar for extreme poverty of only \$1 per day, it was "only" 80% of the world population in extreme poverty in 1860 versus far less than 5% of today's population. The drop in poverty has been truly unbelievable.
- 3. SAVED THE WHALES:** In the mid 1840's, harvesting of whales for their clean burning oil for indoor lighting peaked. Herman Melville's Moby Dick was about whaling for oil. Though the number of whaling ships didn't decline when whale oil production did, finding whales became more difficult due to their plummeting population. Therefore the price of whale oil began to rise. Whale oil prices peaked in late 1850's. Colonel Drake's first oil well in 1859 was drilled with the goal to find a market alternative for expensive whale oil. Rapidly, kerosene refined from oil displaced whale oil and massively grew the availability of clean burning fuel for indoor light. Kerosene prices soon declined so low that indoor lighting was no longer a luxury, but a household staple. Unfortunately, it is estimated that 250,000 whales were harvested for oil in the 1800's before being displaced by kerosene. Thankfully, whale populations rebounded strongly due to kerosene from oil.
- 4. PLANES, TRAINS & AUTOMOBILES:** Planes are fueled by kerosene, trains dominantly by diesel, cars by gasoline or diesel. All of these products are refined from oil. Batteries don't fly because of their low energy density.
- 5. ENABLED MODERN LIFE:** Plastics are made out of oil and gas -- what modern product / technology does not contain plastic? Natural gas, oil, and coal are the fuels of industry. For example, a large wind turbine has roughly 100 tons of coking coal in its steel tower. The turbine blades are made of petroleum products. The installation and servicing of wind turbines are done with gasoline and diesel powered vehicles as was the mining and transport of the key materials. Virtually all of our modern conveniences depend on oil and gas.
- 6. SHALE REVOLUTION = TRILLIONS IN CONSUMER SAVINGS:** Oil averaged over \$90 per barrel over 2012 - 2014. The US shale revolution drove oil prices to average below \$50 per barrel over 2015 - 2017. This \$40 decline per bbl times 30 billion barrels per year that the world consumes, is a \$1.2 Trillion annual savings. The price declines for global natural gas and NGL's from US shale revolution are nearly as large. On a global scale, energy cost saving from the US Shale Revolution represented about 2% of world GDP. The biggest winners from the shale revolution have been the 7 billion humans on earth, especially the poorer humans who spend a larger proportion of their income on energy.
- 7. BRINGING BACK #MADEINTHEUSA:** Petrochemical, fertilizer, steel, autos and many other energy intensive industries have been returning to the US in massive quantities, due to the U.S. energy cost advantage. These industries are starting to raise blue collar wages, another big win of the shale revolution.
- 8. ELIMINATE U.S. DEPENDENCY ON FOREIGN OIL:** The US imported 60% of our oil in 2006. That will be roughly 15% this year and this is still declining by about 5% every year. The US consumes roughly 20 MMbbls/ day of liquid fuels. This year US oil production will be roughly 11 MMbbls/ day, plus 5 MMbbls/ day of NGLs, plus 1 MMbbls/ day of ethanol for a total of 17 MMbbls / day of US liquid fuel production. While we will still be a modest net oil importer, the US is now a net natural gas exporter and this is rising rapidly.
- 9. COLORADO PRODUCES 3X MORE ENERGY THAN WE USE:** Surging Colorado oil and gas production means that this year Colorado's total energy production, of all types, will be roughly 3X Colorado's total energy consumption. Colorado consumes roughly 1,400 Trillion BTU's of energy per year and this year will produce over 4,000 Trillion BTU's of energy.
- 10. U.S. PER CAPITA CO2 EMISSIONS LOWEST SINCE 1964:** U.S. CO2 emissions per capita in 2017 were lower than any year since 1964 (data can be found from the U.S. EIA or the World Bank). The dominant driver of this reduction has been low-cost natural gas from the shale revolution displacing coal as the largest source of U.S. electricity.