ENERGY: A CHANGING FUEL DYNAMIC

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NOTE: The Introduction, below, is written out as I do not plan on discussing it in the presentation. The rest of the presentation will be in outline form.

INTRODUCTION. From an historical perspective, only 200 years ago what we think of as "energy" barely existed. There were no automobiles. Home heating in most of the world consisted of a wood stove or, in some places, coal-fired steam heating. Except in major cities, fuel was locally obtained.

Once the steam engine was perfected in 1775, that world began to change at a rapidly accelerating rate. By the 1940s, the world found itself at war, and much of that war was fought over access to energy fuels, mainly oil. Energy was no longer a local matter. For the last 60 years, access to oil and, to a lesser extent, natural gas, has been intensely political, in spite of my country's frequent insistence that an unregulated market takes care of all things.

Now the world is facing a new and unprecedented challenge: how to respond to climate change. By "unprecedented", I mean that most governments are designed to address problems that can be resolved in a lifetime, if not in an electoral cycle of a few years. Can our governments call on their citizens to change the daily routines of their lives, and perhaps sacrifice some material comforts, to achieve a result that will not become apparent until a far-distant future? It that too much to expect of democracies, or from dictatorships, or from any other type of government humans have devised?

No one knows.

But for the moment there seems to be a desire, and in some countries a determination, to do what seems responsible. No one wants to create a world that is uninhabitable by the human race. Survival of the species is deeply embedded in the genetic structure of all living things. We are programmed to respond even to a distant threat of annihilation.

In this talk, I would like to present my personal views of what is happening in energy markets today. It is only meant to be a snapshot; the dynamics are changing daily, as one can tell by following the price of oil over the past several months. It is as much a story about contemporary politics as about markets.

COAL.

- abundant and cheap

- largest single source of acid rain: SOX/NOX. Also CO2.
- China - Old-style coal plants taken offline

- New technologies:
  Coal gasification: Capex, increased electricity cost.
  Combustion technology

- Need for coal in mid-term

NATURAL GAS:
- Unconventional: Coal bed methane, shale gas
- Cost of infrastructure, large X-border projects need gov support

OIL:
- Cost of new production
- Instability of market

HYDRO:

- High CapEx
- Lack of new locations
- Effect of drought

GEOTHERMAL:

- Low-temperature generation: THE answer?

BIOFUELS:

- Vast tracts of land needed
- Ethanol mistakes (US)

SOLAR

- Larger scale generation now available

WIND, TIDAL

- Limited locations

- Need for grid nearby

FLYWHEEL

- Possibility of storing solar/wind energy

NUCLEAR

- Capex: Lack of expertise

- Waste storage

ENERGY CONSERVATION

- New energy efficient refits, need for mandates & low-int loans

- Waste heat

- use of light but strong carbon-fiber or composites for vehicles.

CONCLUSION