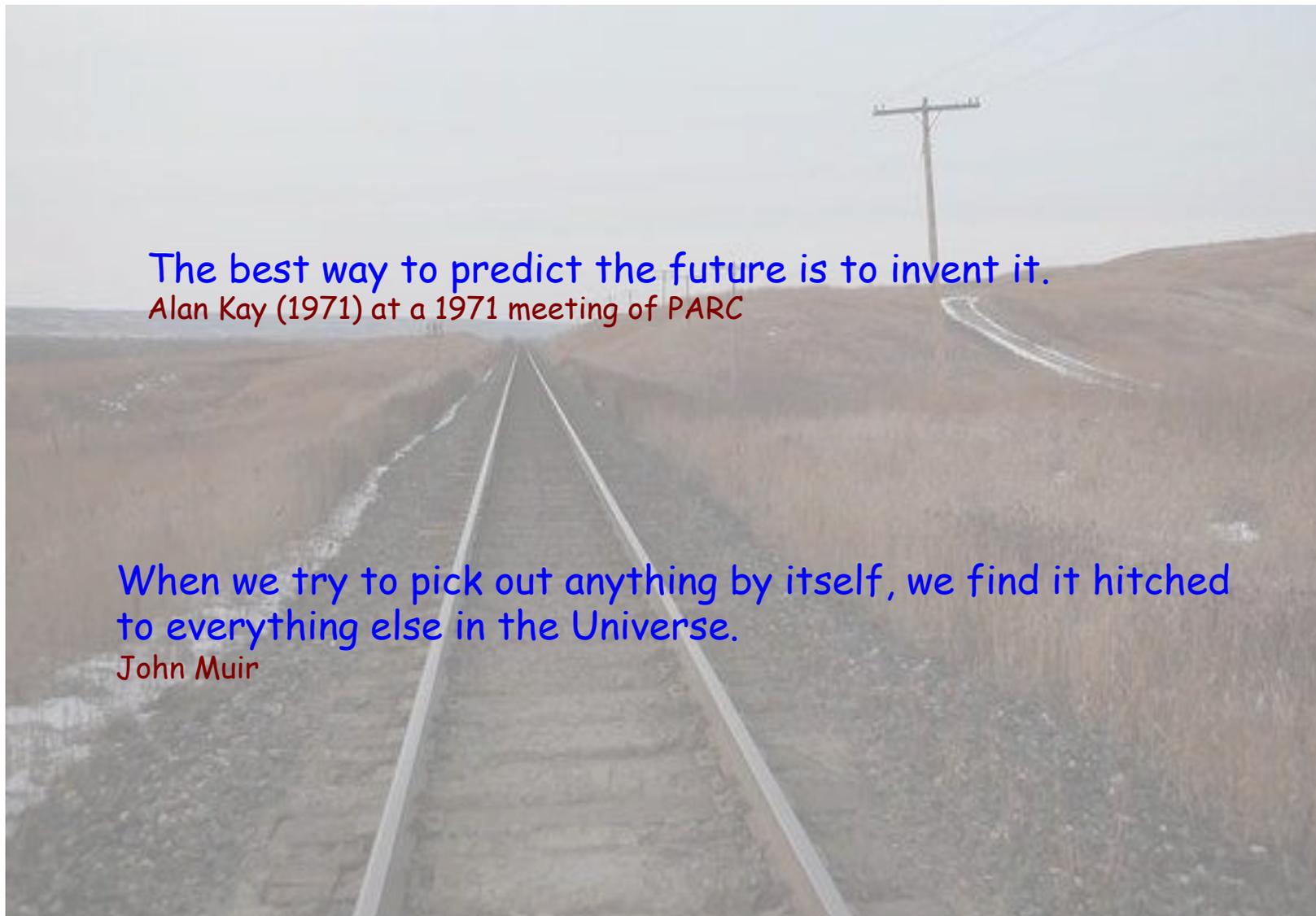




# Energy Systems in 2030

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The best way to predict the future is to invent it.

Alan Kay (1971) at a 1971 meeting of PARC

When we try to pick out anything by itself, we find it hitched to everything else in the Universe.

John Muir

# The World at large in 2030

- The wide-world is likely to continue to be *regionally polarized* both economically and politically
- Regions that offer stability and efficient goods and energy transfer will make sense, and will be the core of new relationships
- Access to investment capital, defense capability and labor mobility will be critical
- Governance, regulation and diversity of energy resources will be in transition

# The Frontiers of Change

- Innovation
  - Technology
  - Data and Information
- Policy shifts
  - Focus on clear(er) technology goals
  - Built in change characteristics
- Systems
  - Integration
  - Balancing and standards



# The Major Transitions in Energy

- Energy generation
  - Natural gas
  - Renewable where appropriate
  - Research on nuclear
- Energy transmission
  - The critical backbone for achieving regional independence as well as international integration
  - This will mean new methods of siting and ROW definition
- Conservation and energy efficiency
  - Data and flexibility will be key drivers





# Major Directional Changes

- Regulation and regulatory compacts
- Carbon management
- International cooperation and collaboration
- Vehicles and transportation
- Future fuel



# The New World of 2030

## a snapshot

- Natural gas becomes the acknowledged policy bridge to a lower carbon world
- Coal is vanquished (to later) and nuclear power is reborn
- Canada has the opportunity to build the first effective, fully monetized carbon exchange
- The dream of green-tea solar power is relegated to daylight hours and more effective grid management
- A new era of transmission technology enables power and communication systems to fully integrate



The future will be different,  
perhaps not the one you prepared for ...

The human mind has reached the end of temporal progress: the future is not what it used to be, and people talk with less and less prognostic self-precipitation into the future, and behave with more and more fatally decisive immediacy. The future, that is, contains nothing but scientific development. It is an involuntary spending and manipulation of physical forces, empty of consciousness: it no longer matters.

– Robert Graves, 1937