Investing in a More Productive Alberta

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Main Ideas

The Future Will be What We Make It

- **Alberta is largely defined by food and natural resources**
  - Lots of opportunities to create more value in these areas
  - Diversification into other sectors will remain small part of GDP
- **We must improve productivity in energy sector**
  - We cannot rely on prices alone to stay competitive
- **Long Term investors can combine the profitable with the desirable by funding new technologies**
  - With a more efficient alternative to traditional VC funding

AIMCo "Big Themes"

- **Energy**
  - Technology is changing production, transportation and use of energy
  - Energy has always been at the root of major changes in productivity
- **Food**
  - Must double supply over next 20 years to meet growing demand
- **Materials**
  - The global intensity of resource use relative to GDP will drop
  - The growth of GDP in the developing world will still drive demand
- **Enabling Technology, e.g. Robotics**
  - Ways to relieve labour shortages and gain back industrial production

The Future Is Better Than You Think

Source: Abundance: the Future is Better than you Think. Peter Diamandis and Steven Kotler, 2012

- **Exponential growth in transformational technologies**
  - Computational systems, wireless networks, biotechnology
  - 3D-printing, i.e. additive manufacturing
- **Increased importance of "do it yourself" innovation**
  - Scale not as important as before: return of the backyard tinkerer
- **Wealth from high-tech revolution is directed to help solve impediments to global abundance**
  - Techno-philanthropy investments in malaria research, education
- **A billion people will join the wireless world by 2020**
  - Faster dissemination of knowledge and locally relevant information

Innovation is accelerating

- Power generation efficiency of wind turbines and solar panels
- Efficiency of energy transmission and use
- Carbon neutral fuel from algae and wood fibre
- More productive crops
- Cost of sequencing a genome has fallen below $1000
- Medical diagnostics: lab on a chip
- Driverless vehicles already operating in factories, legal by 2025?
- Materials 10 x stronger than steel, fraction of the weight

2013 Announcements

- **Lockheed is developing low-cost desalination method**
  - Graphene screen allows low-energy, low pressure salt separation
- **Philips will have vastly better LED lamp for sale by 2015**
  - 200 lm/W new LED, 75 lm/W small fluorescent,15lm/W incandescent
- **“Heuristic” chip will run at 1/5 of current energy cost**
  - Sacrifices accuracy for speed, e.g. hearing aids, weather forecasting
- **Reduction in crude oil refining cost**
  - Lower temperature, lower pressure, lower energy, lower emissions

Technology and Oil

- **High prices invite conservation and substitution**
  - With a lag
- **Technology will reduce marginal producer's price**
  - Synthetic crude from wood
  - Waste to biofuel
  - More efficient ways to process shale oil and bitumen
- **Only lower energy production cost will keep us competitive**
- **Will also need to address transport and and environmental issues**

Investor Dilemma

- **Only 2 out of 10 feasible ideas will be economical**
- **The initial R&D has traditionally been heavily financed by government**
  - US Department of defense
  - Germany's Max Planck Institute
- **Canada has no equivalent of similar scale**
- **Energy technology tends to be capital-intensive**

Who Will be the Future Players

- **Traditional VC 2 and 20 model is too expensive**
  Has not produced better returns than listed markets
- **Pension and endowments have been slow to enter**
  early stage investing because of high labour intensity
- **Institutional investors like AIMCo**
  are gravitating to an enhanced angel model
- **There is a role for technology advisory organizations**
  to select startups with best chance of commercialization

Institutional Role in Funding Start-ups

- **Institutional capital size matters - to keep cost down**
  - We can manage assets for 1/3 to 1/5 the cost of the 2 and 20 model
- **Long run focus: capital committed for many years**
  - We have cash and patience
  - Do not need vehicles with limited lifespan
- **Our participation is particularly useful in commercialization**
  - Which is the weakness of traditional VC funds
- **Need better ways to identify good early stage firms**

GOING WHERE OPPORTUNITY IS NEXT

AIMCo
Alberta Investment Management Corp.