Greening ICT. Greening through ICT.

7th SYMPOSIUM on ICTs, the environment and climate change

Quebec's Green ICT initiative:

The Equation Project

Quebec's Green ICT initiative: The **Equation** project

- **Moderator: Charles Despins, Prompt**
- **Cloud Computing / Telco clouds:**
  - Ericsson Canada
  - Fujitsu Canada
  - Miranda Technologies
  - Teledyne DALSA
- **Smart Grids:**
  - CGI
  - IBM Canada and Trilliant

❑ See www.equationict.com

Développement économique, Innovation et Exportation Québec

eQUATION
A Major GreenICT Initiative

www.equationict.com

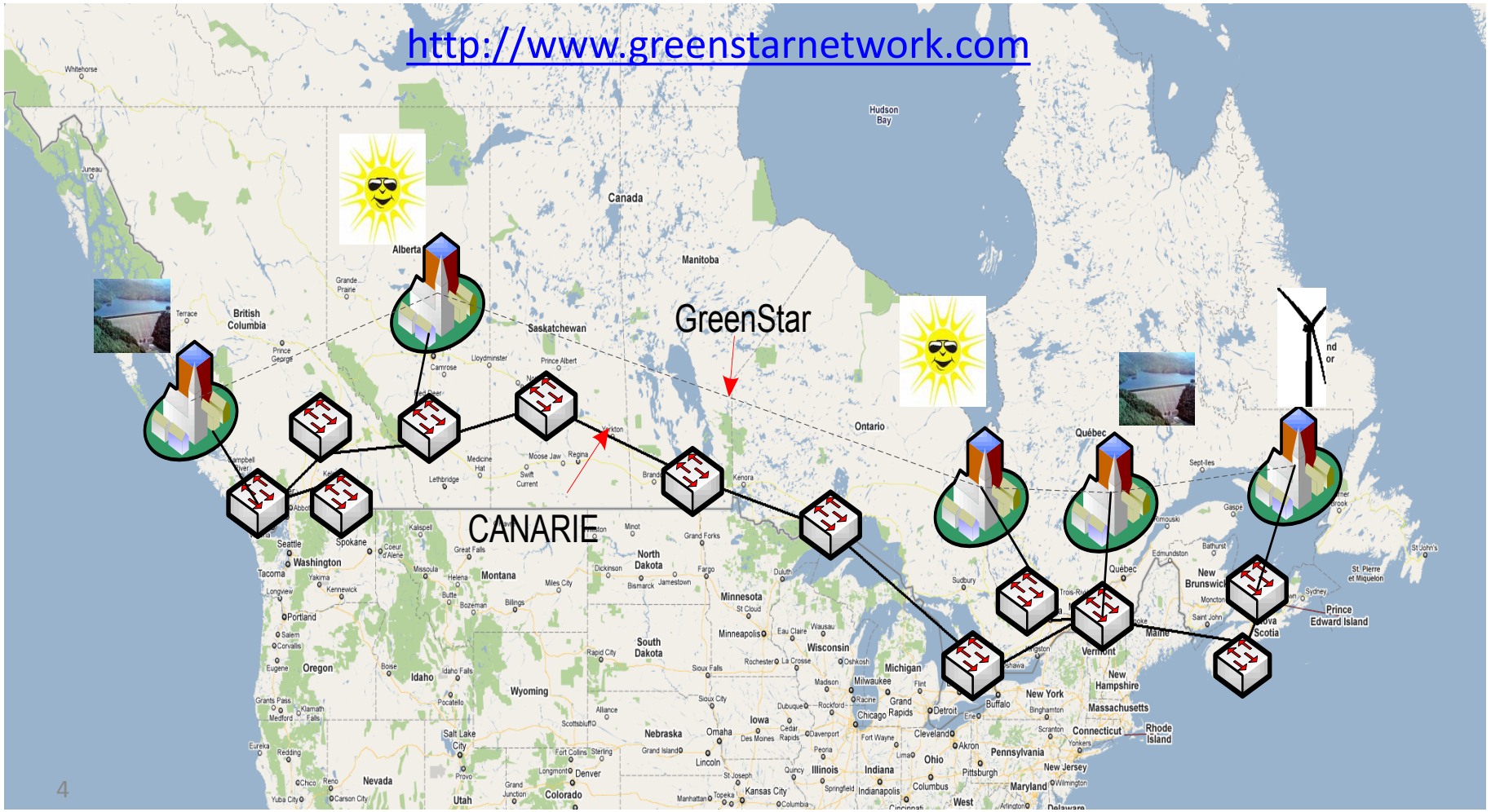
CGI | ERICSSON | FUJITSU | IBM | Mirandja | TELEPHONE DATA

Equation project (70M$ CDN)

A public-private partnership with 6 companies and the Québec government;

- ✓ Focus on telco cloud & smart grid solutions product development;
- ✓ Partnerships with universities and local SMEs;
- ✓ Link to ITU G-ICT standard development.
- ✓ Data center / digital economy business case studies.
- ✓ Three-year project launched November 29th 2011.

Greenstar (GSN): a zero-carbon telecom network pilot project

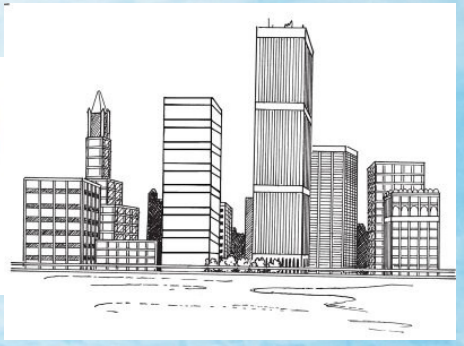


POWER (co-located)

Digital economy strategy

Distribute information and not energy
Energy savings $$
Carbon credits $$

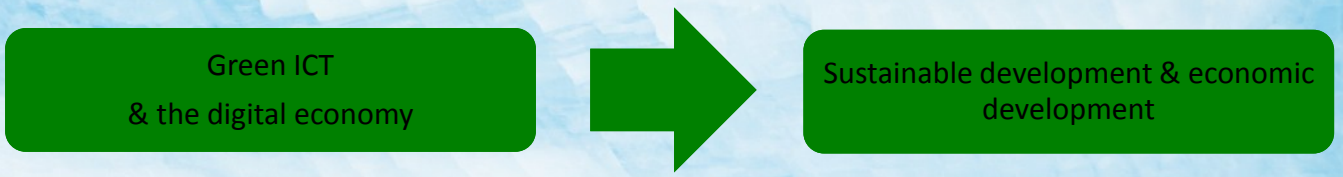
POWER (distributed)



Any jurisdiction developing and exploiting renewable sources of energy can be a hub for the 21st century, digital, low-carbon economy.

- Virtualizing ICT infrastructure and co-locating data centers with renewable energy sources:
  - ✓ Green benefit: energy efficiency and GHG emission reductions.
  - ✓ Digital benefit: economic incentive for broadband network deployments.
  - ✓ Productivity benefit: economic incentive for investment in ICT products

Green ICT must be a key element of both a digital economy strategy and an action plan to combat climate change.



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EcoloTIC - Ericloud

Experimental distributed cloud infrastructure for Data and Service Centers

ERICSSON

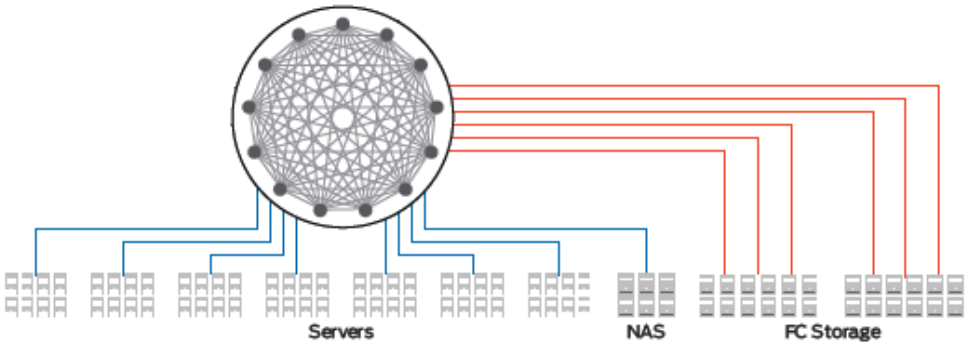
EcoloTIC – Ericloud Purpose

"Data Centers are one of the fastest growing parts of the ICT industry and it is essential to reduce energy consumption and GHG emissions from these. ITU-T Recommendation L.1300 "Best Practices for Green Data Centers" states that **reducing energy consumption** and GHG emissions should be considered at the design and construction stages, and that constant monitoring will be required to consistently **manage and improve energy consumption while the data center is in operation**."

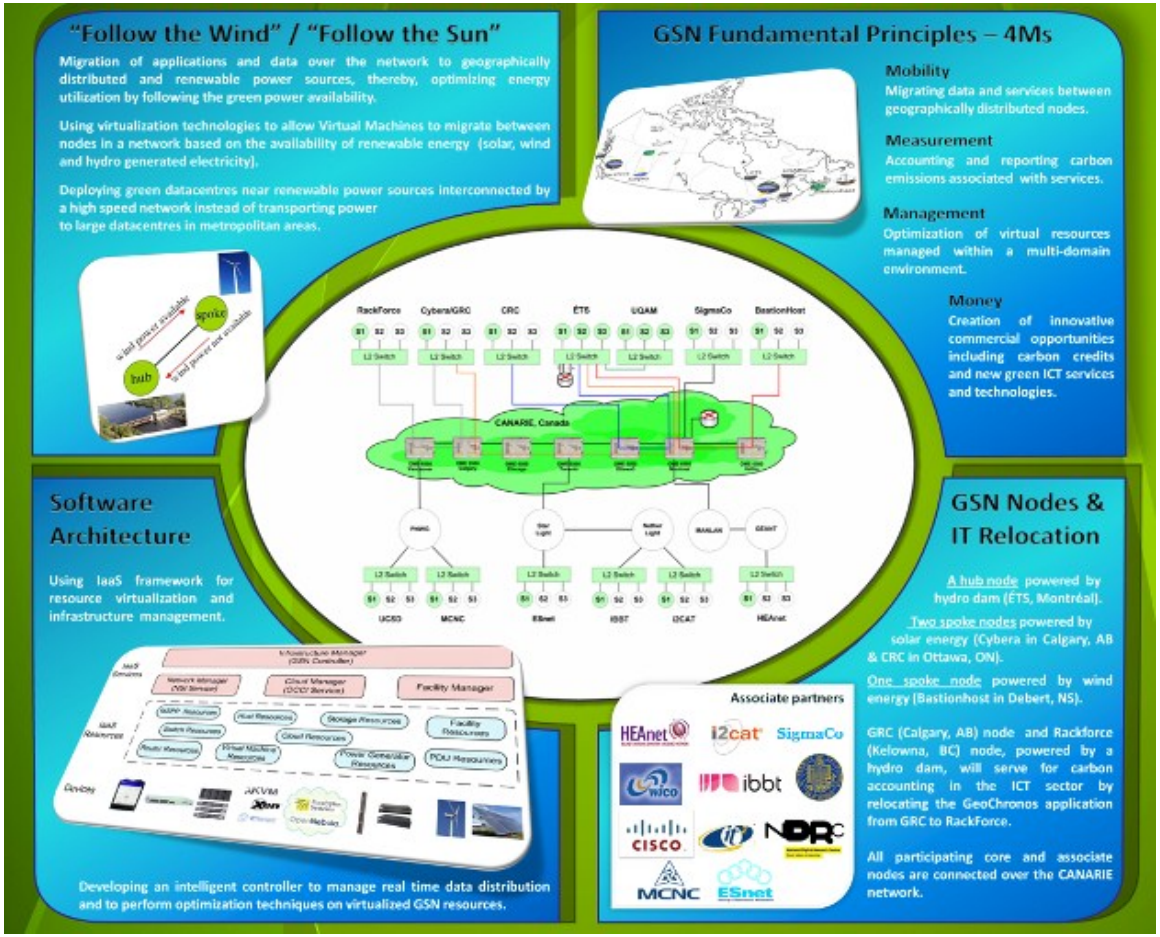
- The BroadBand Bridge, ITU Broadband Commission, p. 10, April 2012.

EcoloTIC Ericloud Track A: Reducing Energy consumption through the Network Fabric

Tomorrow's data center and cloud computing systems require a **Network Fabric (Fabric for Networks)** that unites all network elements for processing and storage as a single, logical entity.



EcoloTIC Ericloud Track B: Manage and Improve Energy consumption of Data Centers – the Greenstar project



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ICT & Sustainability

Fujitsu Innovation Center

Rémi Jean, Fujitsu Canada Director

Montreal, May 30th 2012

FUJITSU an ICT company committed to sustainability

Fujitsu

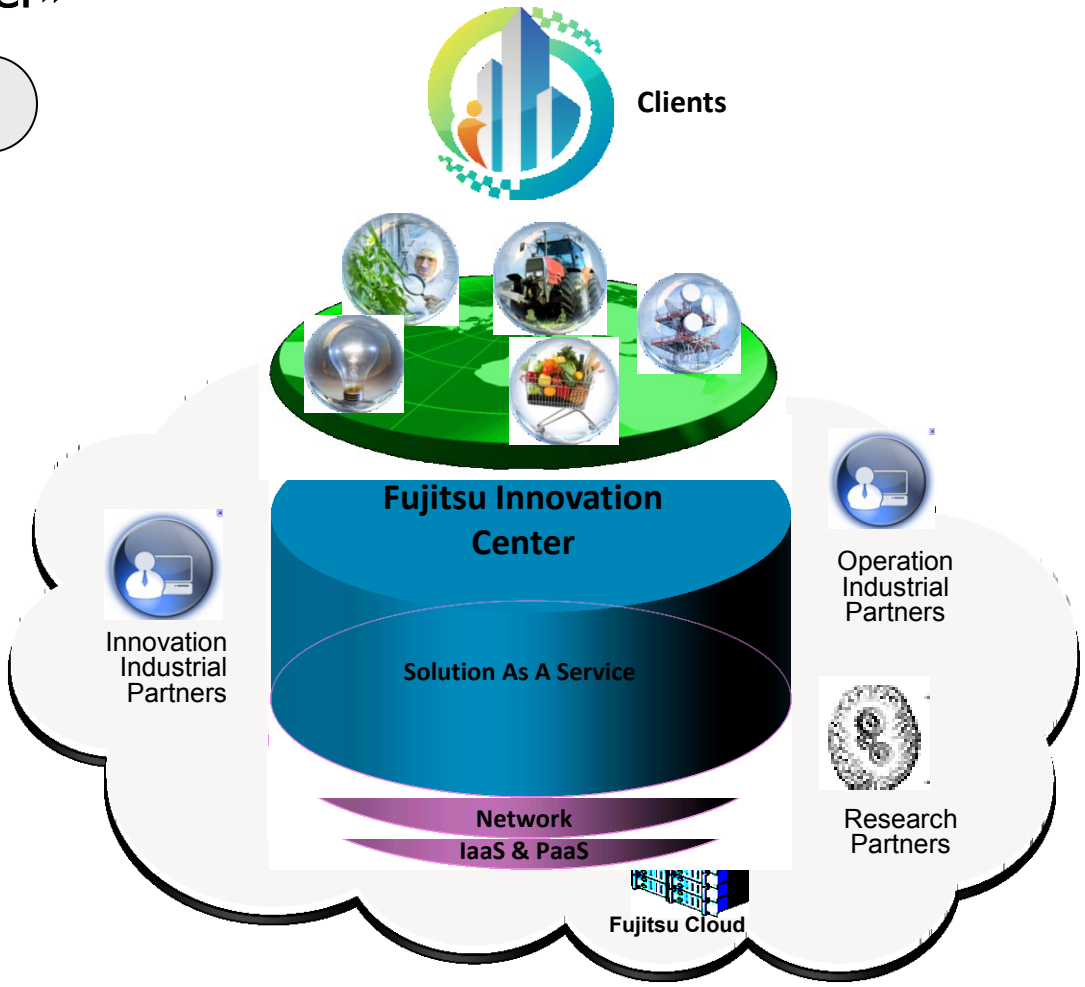
- World's 3rd ICT provider, 1st in Japan
- 172,000 employees in 70 countries
- Revenues: US$55 billion
- US$2.7 billion in R&D every year
- 34,000 patents

Recognized for being deeply involve in Green IT

- **IDG Computerworld** "Top Green-IT Vendors". Fujitsu is the number one Green IT supplier, two years running.
- **Greenpeace** "Cool IT Leaderboard". Fujitsu is 3rd overall and 1st in terms of IT Climate Solutions.
- **Gartner and WWF** "Low-Carbon and Environmental Leadership in the ICT Industry" for 2010. Fujitsu 1st in 2 of 5 categories : "IT transformation" and Internal environmental performance" as well as 2nd overall.
- **Newsweek** « The World's Greenest Companies ». Fujitsu in top 15 of "Green Global 500 Ranking".

The «Fujitsu Innovation Center»

The Fujitsu Innovation Center (FIC) capitalizes on expertise, skills/know-how, products & solutions from Fujitsu and its partners for the creation, demonstration and promotion of new-innovative business solutions in an collaborative and sustainable mindset.



Ongoing EcoloTIC / Cloudius projects

- Cloud computing infrastructure for experimentation, demonstration and promotion of cloud solutions
- A complete multiplatform cloud-oriented end-user workspace solution
- A cloud-based solution for CIO surveys on innovation

(Ongoing EcoloTIC / Cloudius projects)²

Greening assessments projects using the cloud

- Solutions
  - Environmental evaluation tool to calculate the global impact of an ICT solution (EcoCalc)
- Data center
  - Energy efficiency assessment tool for small, medium and large facilities
- Enterprise
  - Global Green IT and sustainability assessment

Conculsion

- It's great to see that working hard on Green IT is more than ever a lever for the ICT sector
- We must all continue promoting the fact that sustainable development is an added value from and for ICT
- We are looking forward to presenting you great results from the FIC in the coming years

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“Advanced Management Systems for Cable and IP Television Networks”

Miranda

Did you know?

$10	Cost of a customer call
$100	Typical cost of a truck roll
10,000+	Average number of alarms

Rolling trucks to respond to customer complaints is costing cable and satellite TV operators time and money…

…and it is not the greenest way to manage customer satisfaction

- Miranda's iControl is an advanced Network Management System for broadcasters, content originators and television service providers, performing wide-ranging video & audio signal, device and facility monitoring and control over IP networks

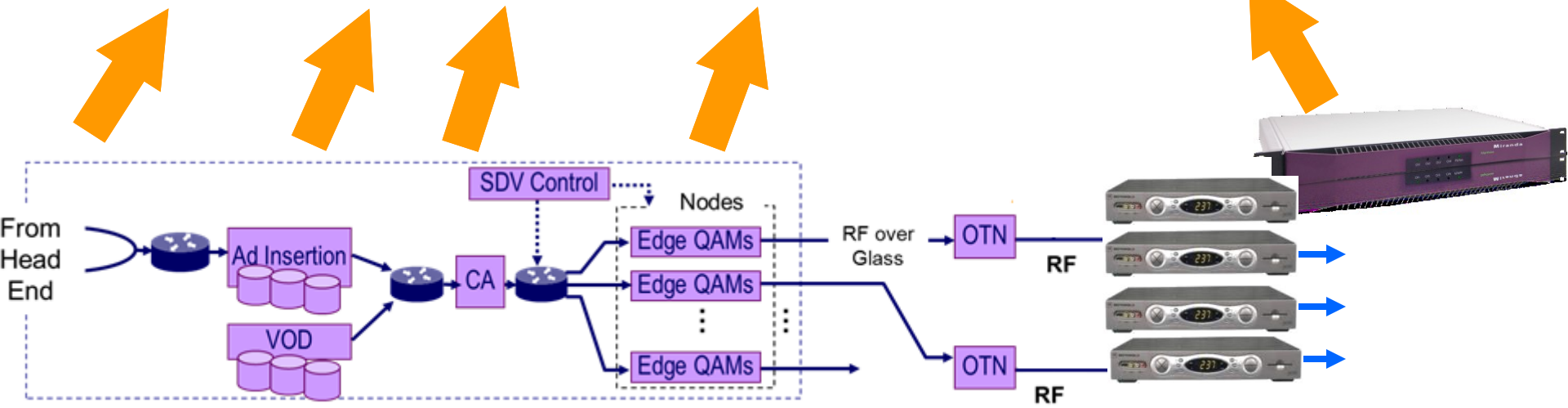
- Monitoring of quality all TV services across headends and locals hubs
- Control of several platforms
- SNMP monitoring of all key systems across the network
- Provides operations live views of system using detailed, dynamic topology views

With *Project Equation*, Miranda Technologies has further invested in the development of both IP video and network edge monitoring platforms

IP Video

EdgeVision

IP Video and set-top box signal monitoring to *see and hear* things from the perspective of the subscriber



Allowing operators to pro-actively deliver quality television while having a green impact on their customers' environment

Miranda

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EQUATION
A MAJOR GREEN ICT INITIATIVE
Technology + Ecology = Economy

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TELEDYNE DALSA
Everywhereyoulook™

A low-power, custom integrated optoelectronic switch product for digital optical-fiber communication networks

Marc Faucher
Director of Product Development Solutions
May 2012

Who is Teledyne DALSA ?

- Teledyne DALSA (www.teledynedalsa.com)
  - owned by Teledyne Technologies
    - revenue of $1.94 billion in 2011
    - 9,000 employees worldwide
- An international leader in high performance digital imaging and semiconductors with approximately 1,000 employees worldwide
- Established in 1980, Teledyne DALSA designs, develops, manufactures and markets digital imaging products and solutions
- The Semiconductor Division, located in Bromont, Québec, has a proud history of innovation in specialties such as MEMS, CCDs, and High Voltage CMOS products

TELEDYNE DALSA
Everywhereyoulook™

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Teledyne DALSA product development in the Equation project

- The next generation (up to 25 Gbps) integrated optoelectronic switch module that combines
  - Compact MOEMS micromirrors (Micro-Opto-Electro-Mechanical Systems)
  - Low Power, High Precision, High Voltage ASIC Driver Circuit
  - Advanced Wafer-Level-Packaging
- The new optoelectronic switch will be located in compact blade servers used in data centers for cloud computing applications

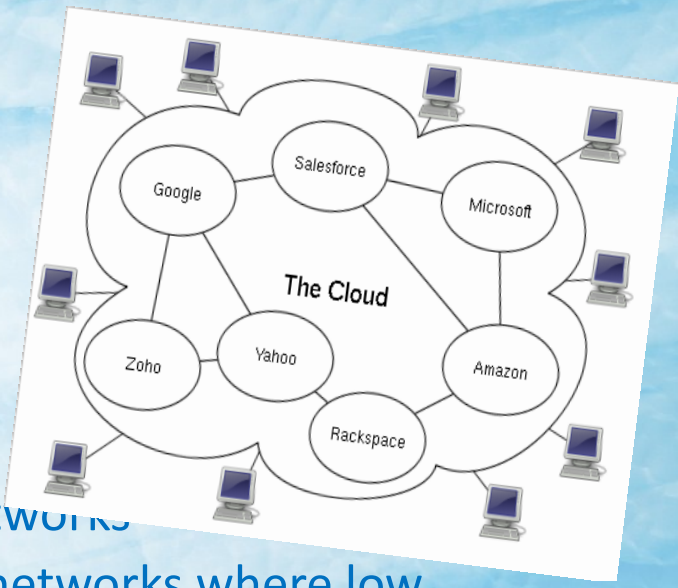
TELEDYNE DALSA Everywhereyoulook™

Benefits of the product developed by Teledyne DALSA

- Elimination of energy-hungry, heat-generating, optical-electrical-optical conversion modules (i.e. all-optical signal path inside and in-between blade servers)
- Low power consumption of both the MOEMS circuit and its ASIC driver
- Smaller form factor and ultra-compact architecture, reducing overall burden on data center ambient control

Benefits of the product developed by Teledyne DALSA (cont.)

- Flexibility to scale dynamically the network configuration according to varying traffic loads in the cloud
  - Low traffic = unused servers put in energy-saving, “sleeping” mode
  - High traffic = re-direction toward specific data centers with available capacity & renewable energy sources (solar, wind, etc)



- Lead to the building of Quebec infrastructure in low power, high speed, digital optical-fiber networks
- Pave the way for other types of communication networks where low power consumption, small weight, are critical factors: aircrafts, cars, low-energy “smart houses”, etc.

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The Pragma®SMART Project

ICTs in the world of Smart Grid

CGI

- As a leading provider of information technology (IT) and business process services, CGI has been serving the electric, gas and water utility industry in North America with Information and Communication Technologies (ICTs) for over 20 years.
- Thanks to the mobilizing Equation project, CGI will integrate the emerging technologies of Smart Grid for greater improvements in daily operational activities of its customers and a reduction of greenhouse gas emissions.

Applying ICTs to Smart Grid

- Several aspects of Mobile Workforce Management (MWM) and Outage Management (OMS) will benefit from tangible improvements by intelligent ICTs:
  - Route optimization technology monitors vehicles with satellite technology and optimizes travel while improving energy conservation and worker safety;
  - Crew travel distance is decreased as a result of optimized routing, driving reductions in energy consumption and greenhouse gases;
  - Fault localization technologies reduce outage duration and accelerate service restoration while eliminating unnecessary use of crew vehicles;
  - Advanced Metering Infrastructure capabilities provide network status information through remote meter interrogation and automated outage notifications for timely problem resolution.

Applying ICTs to Smart Grid

- Distribution Power Analysis will help optimize switching, expedite restoration efforts (reduced outage durations and energy losses) and minimize energy losses (optimized switching orders);
- Combining geo-referencing and visualization technologies will provide a unified, graphical operational console for situational analysis - the missing “big picture” of distribution operations;
- Internet and web services technologies will facilitate the relocation of customer-services and enable outage management (OMS) and mobile workforce management (MWM) call centres to reduce operating costs (communications, transportation, …);
- Predictive capacity will improve during storm situations via intelligent weather predictions as well as forecasting of restoration costs and effort based on historical compilation of damages.

In Summary

- Intelligent technologies driving reductions in transportation costs, greenhouse gas emissions, optimization of mobile workforce travel, and the reduction of operating costs becomes an integral {e}quation in the pursuit of economic and ecological benefits to daily utility operations.
- Opportunity to promote the expansion of CGI from Montreal to international energy markets with innovative solutions, benefiting both our current and future clients in North America and Europe.

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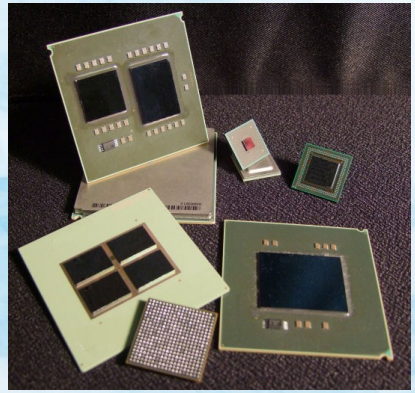
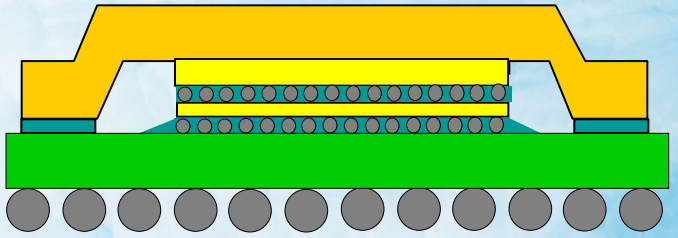
IBM's participation in the Equation

Where ? At the Bromont, Quebec plant

What is being done at the IBM Bromont plant ?

- A site dedicated to the development of new processes and the manufacturing of module packaging for the semiconductor industry

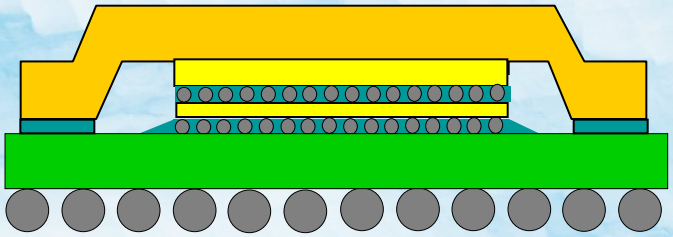




IBM's participation in the Equation

The scope of the work to be done :

- Development of a series of new manufacturing assembly processes more “environmentally/ecologically friendly”
  - Less chemical or water usage
    - Example : Creating/developping a process that won't require water cleaning after chip placement on the substate.
  - Less energy consumption
    - Example : Creating/developping a process that reduces the number of high temperature reflows in furnaces to do the joining of components.
- Contribute to making “greener” the assembly of TICs

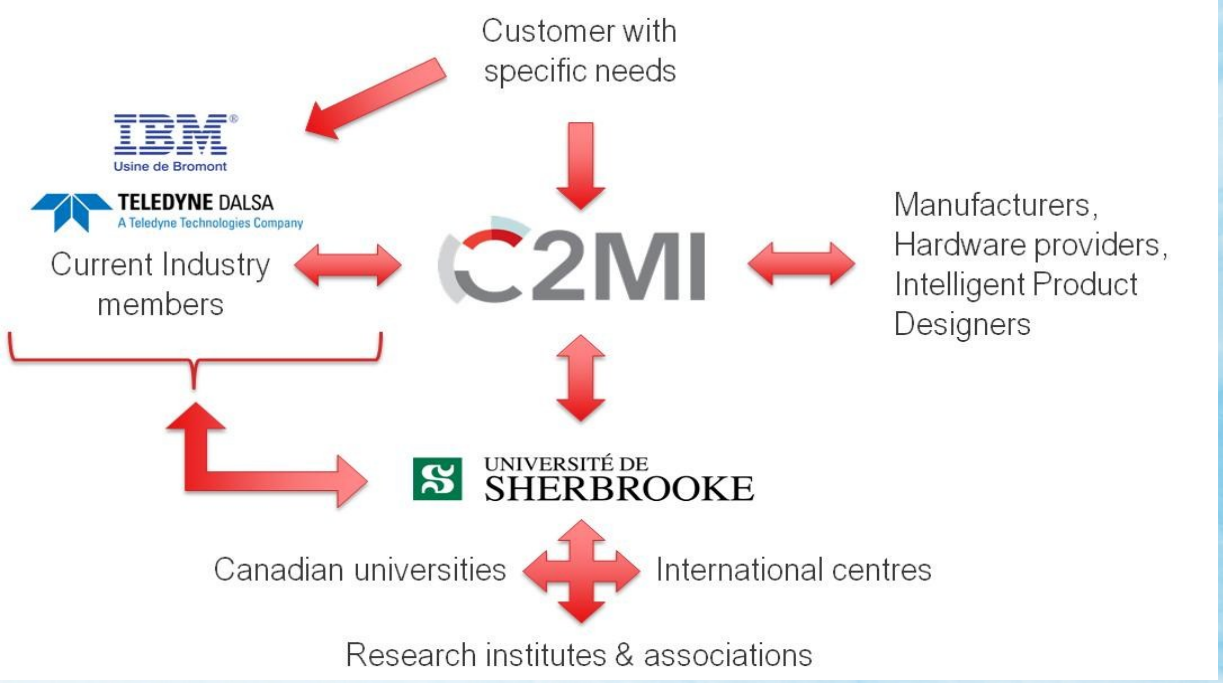


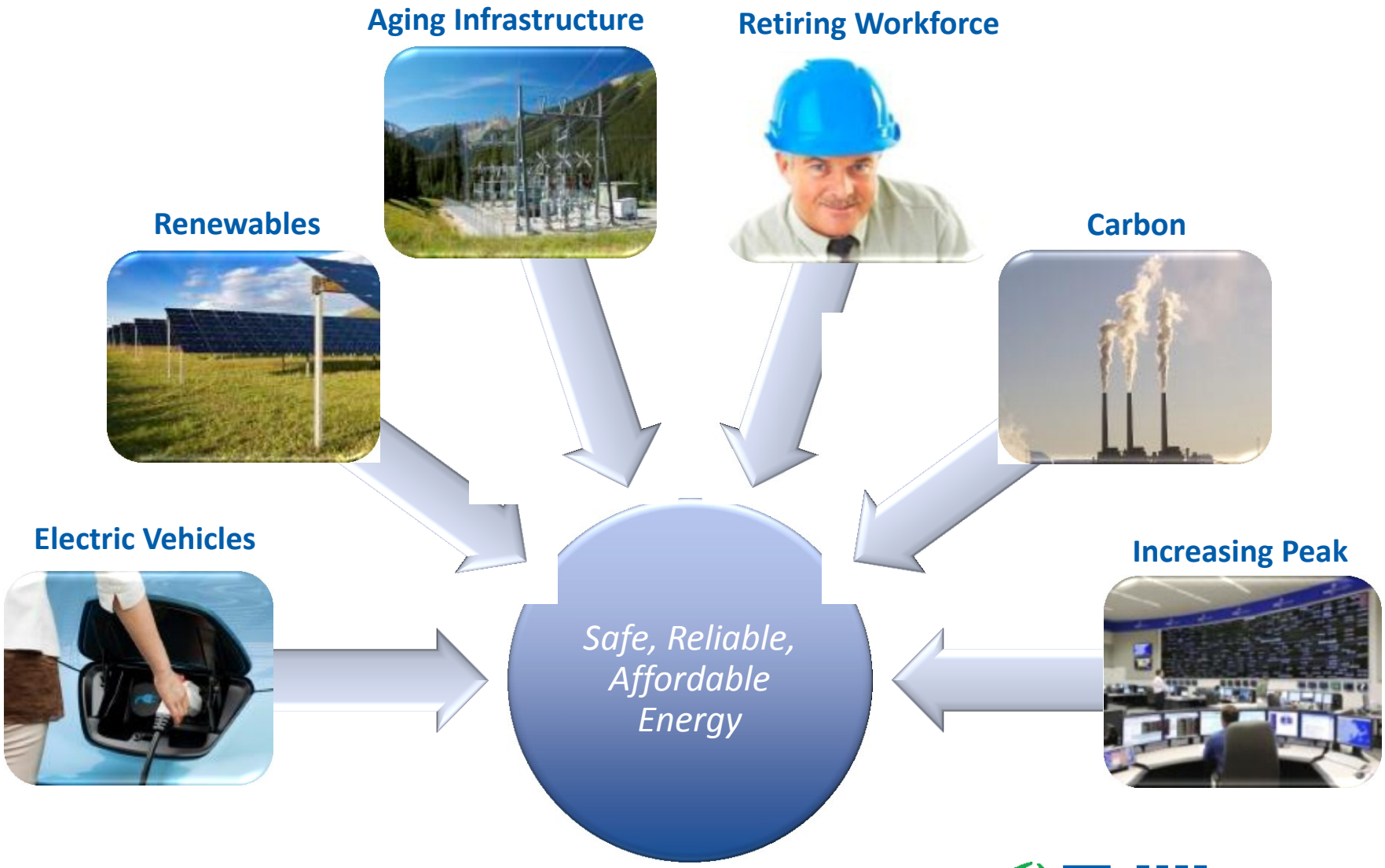
The new C2MI collaboration center

Canada C2MI Québec

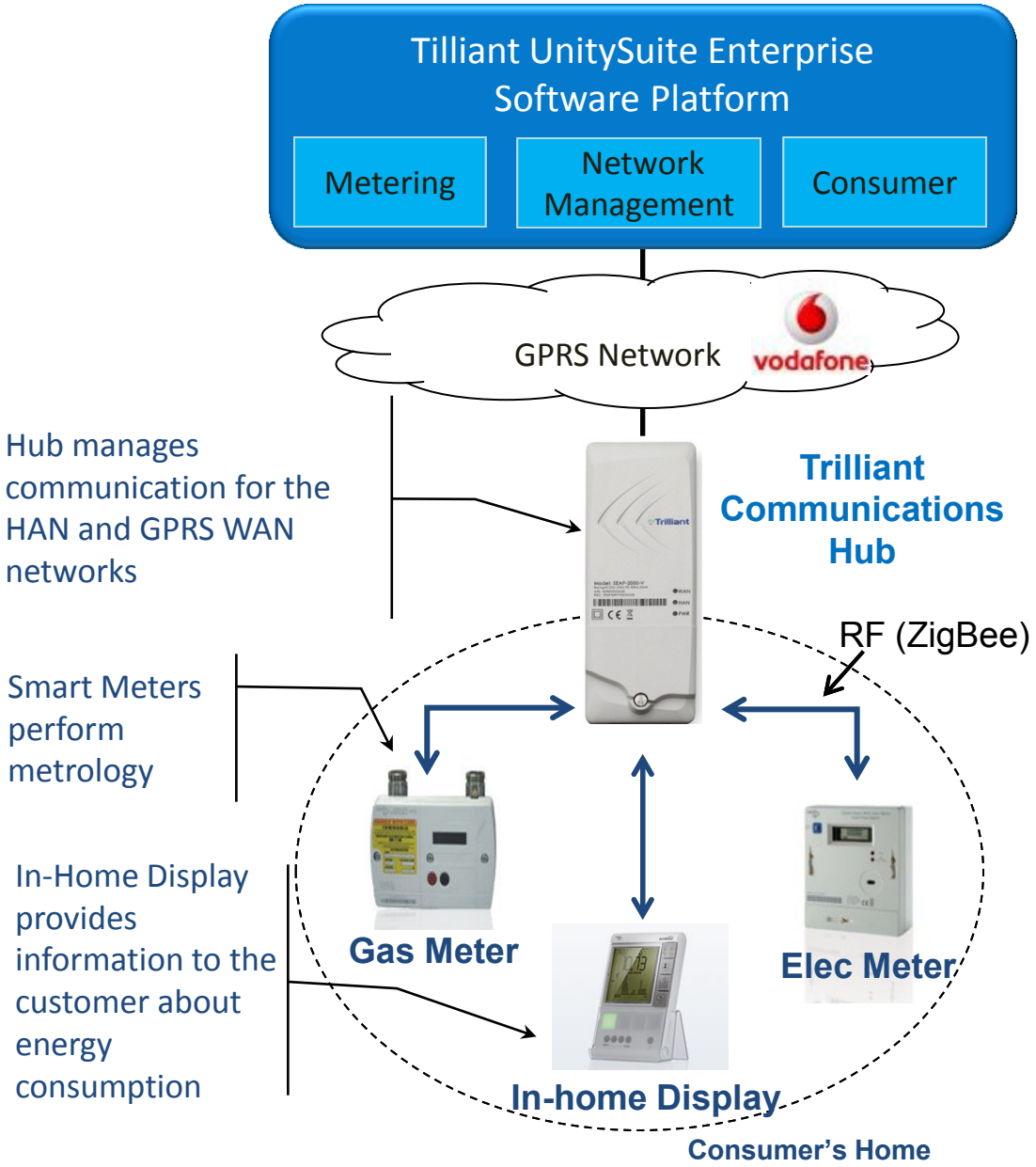
Its mission:

A site dedicated to the development, qualification and transition/transfer into production of new products and applications




Aging Infrastructure
Retiring Workforce
Renewables
Carbon
Electric Vehicles
Increasing Peak
Safe, Reliable, Affordable Energy

Trilliant



British Gas

Trilliant's Solution:

- **Communications Hub:** Public cellular (GPRS), IP, and DLMS over ZigBee
- **Scalable head-end software:** building on UnitySuite platform
- **Lead standards building:** Smart Specification Working Group (SSWG)

Project Success:

- **Reduced energy consumption:** Reduce Carbon emission
- **Remote Billing**
- **System is in production:** rollout begun Q1 2012
- **1M+ meters in 2013**
- **Will be the largest ZigBee deployment in the world**

Trilliant

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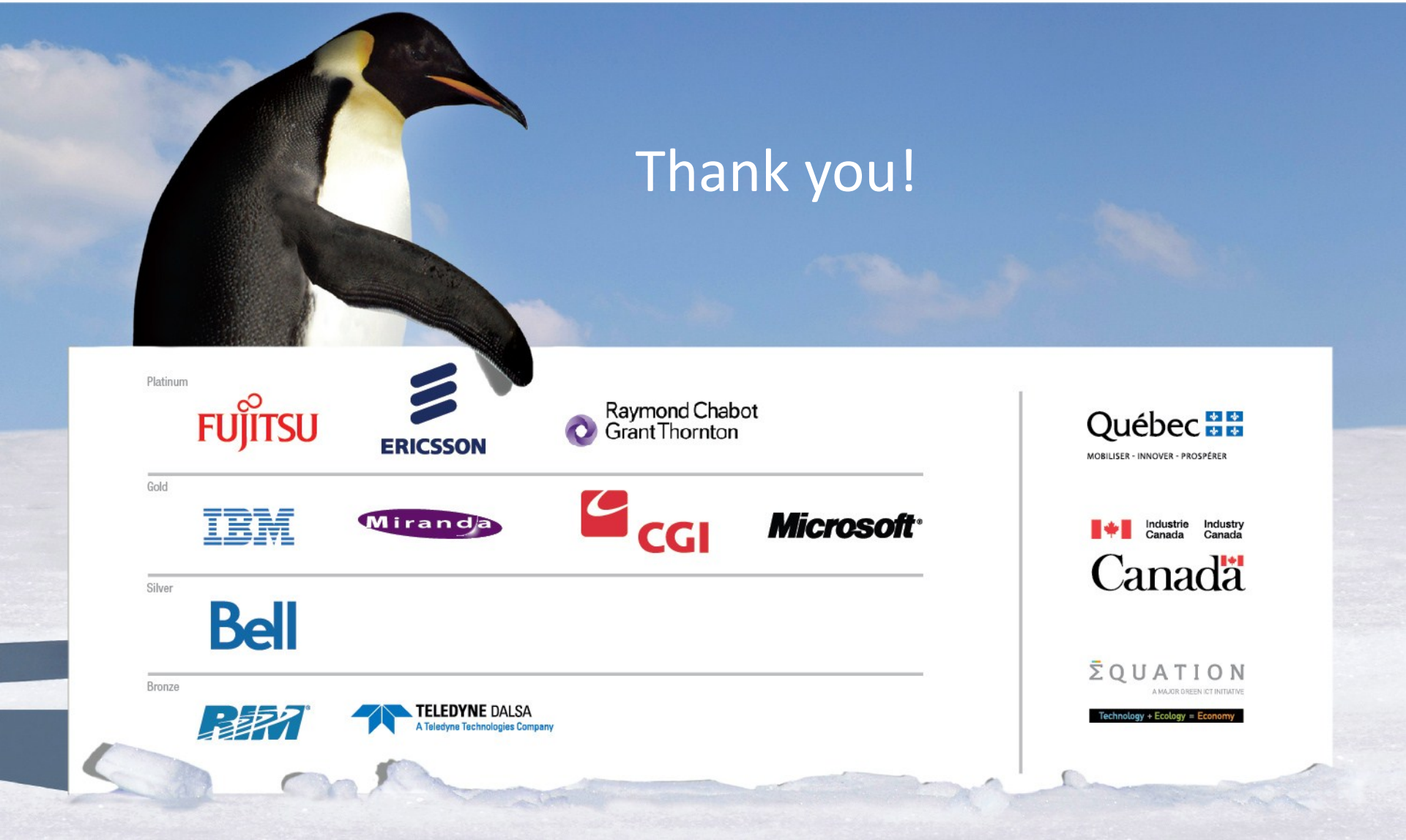

Thank you!

Platinum

FUJITSU

ERICSSON

Raymond Chabot Grant Thornton

Gold

IBM

Miranda

CGI

Microsoft

Silver

Bell

Bronze

RIM

TELEDYNE DALSA
A Teledyne Technologies Company

Québec
MOBILISER - INNOVER - PROSPÉRER

Industrie Canada Industry Canada
Canada

ÉQUATION
A MAJOR GREEN ICT INITIATIVE
Technology + Ecology = Economy