Europe – Canada collaborative R&D Opportunities:

Driving sustainability through integrated information and energy infrastructures

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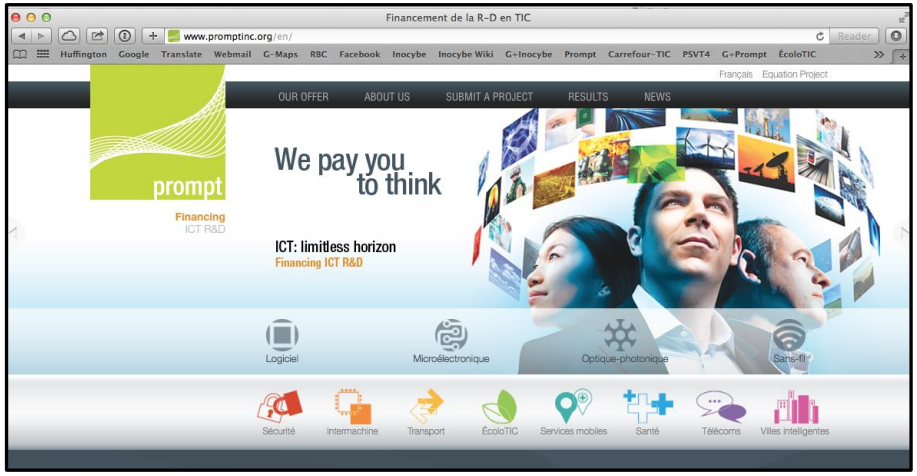
Prompt : Financing R&D in ICT

- Non-for-profit, private – public partnership:

- 100 R&D partnerships in 12 years:
  - Total partnership value: 150M $CDN.
    - More at www.promptinc.org



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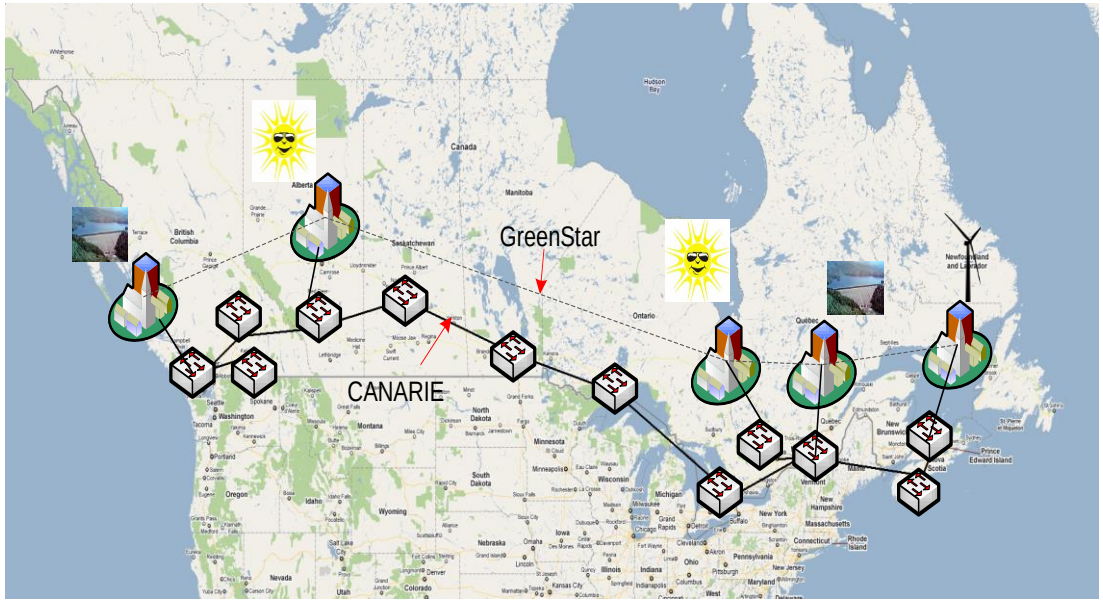
An ICT-energy convergence example: The GreenStar Network

- A Zero-Carbon telecom network pilot project:
  - Network level virtualization and ICT CO_2 protocol;
  - Off-Grid zero carbon energy to power networks and data centres;
  - European collaboration thru PanLab (FP6) and Mantychore (FP7).
  - A federated network is considered.



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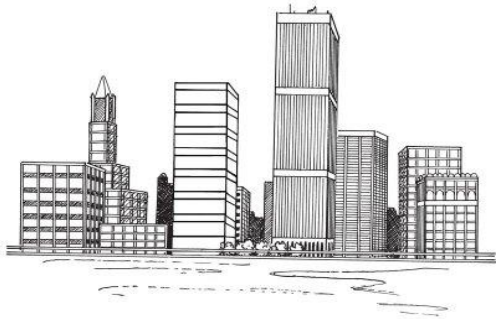
Energy – ICT convergence in Broadband strategies

- Linking Environmental & Socio-Economic Benefits:
  - Exploiting Québec's 98% renewable energy:

Digital economy strategy & Adoption by communities

POWER (co-located)



POWER (distributed)

Distribute information, not energy

Energy efficiency $$

GHG emission reductions $$

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ICT: limitless horizon
Financing ICT R&D

Arctic Fibre & Keskuun Data Centre Projects

- A 650M$, 15,289 Km, 30 tbps route between Tokyo & London via Canada's Northwest:
  - Bridging the digital divide between major cities and Québec's Great North.
- Québec's James Bay hydroelectric facilities are strategically situated at the crossroad between Asia, Europe and North America;
- An ideal situation for Green Data Centres and test beds in Next Generation Networks:
  - Eeyou Istchee Keskuun Green Data Center Valley project (up to1,000 MW – 8 TWh/yr);

YAB MANAGEMENT
Consulting Services in the Canadian North

TAWICH DEVELOPMENT CORPORATION

ARCTICFIBRE

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EQUATION
A MAJOR GREEN ICT INITIATIVE
Technology + Ecology = Economy

Equation major project

- 4-Years 67 M$ in Green ICT:
  - Carbon neutral solutions + Climate changes challenges = Economic, Social and Environmental benefits.
- Public-Private Partners, all part of the Equation:
  - 37M$ by 7 Major players & 30M$ by Province of Québec;
  - 7M$ to 43 SMEs & Research Organizations.
- Objectives:
  - Accelerate Industrial development for partners;
  - Building a Green ICT ecosystem;
  - More at www.EquationICT.com

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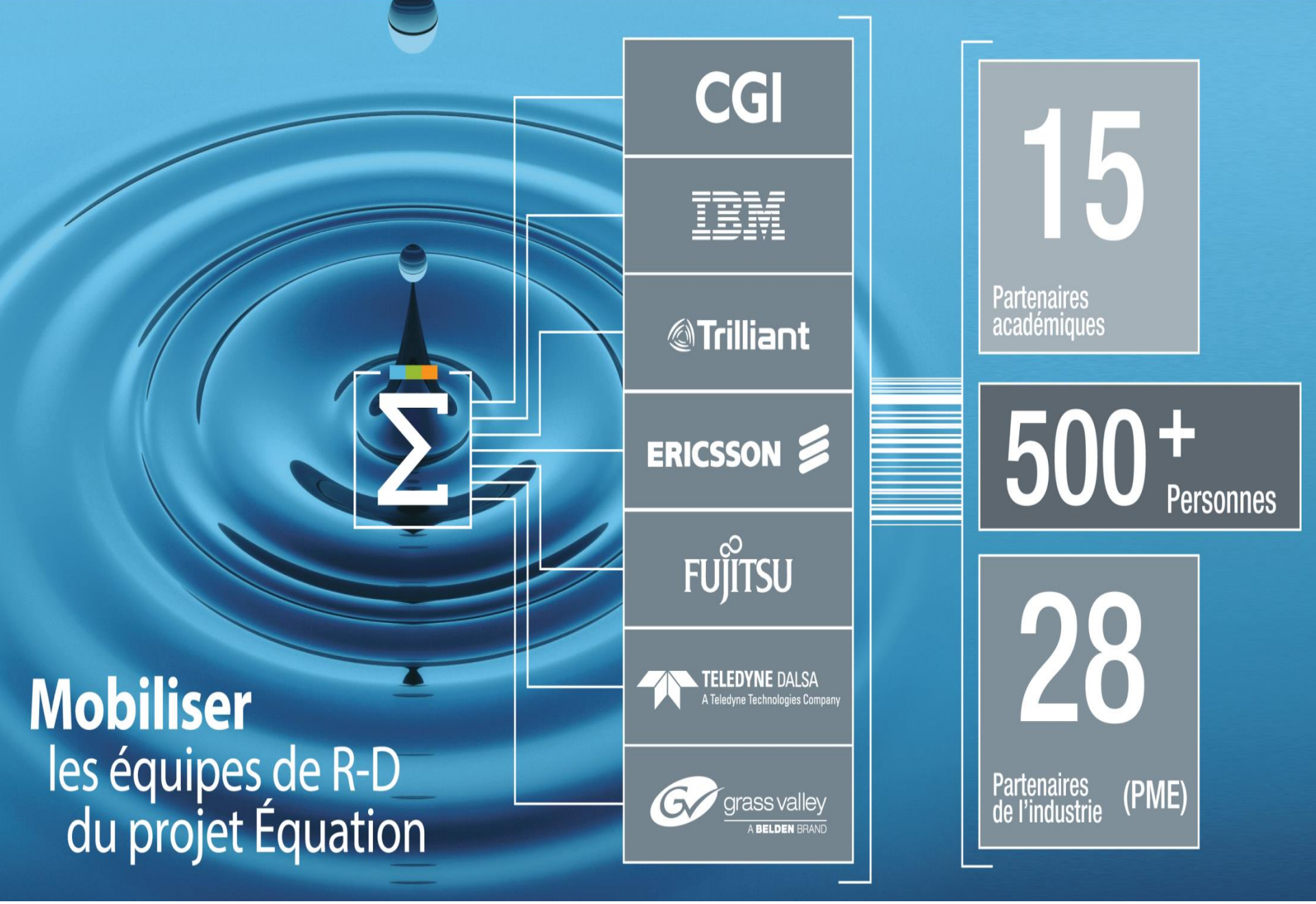
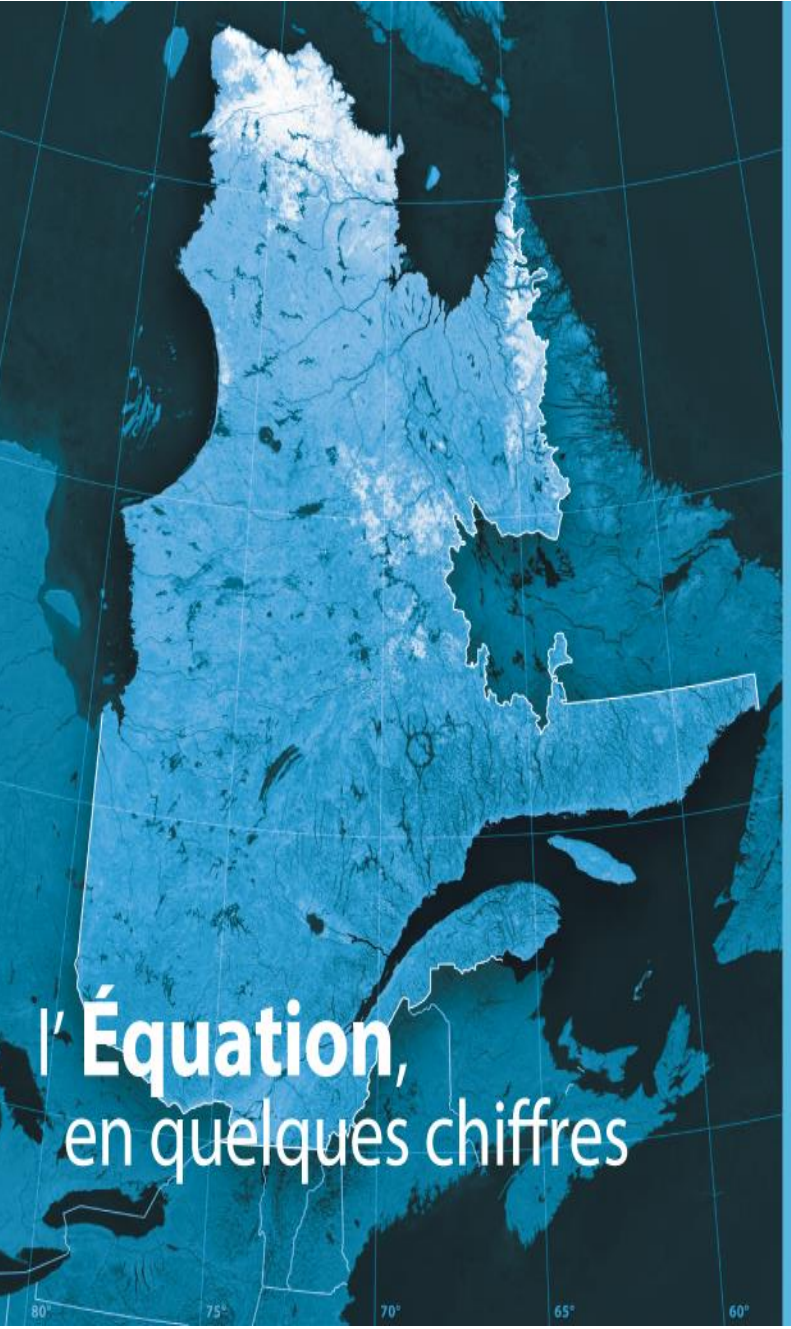


MOBILIZING R&D TEAMS in SMEs and ACADEMIA

CGI
IBM
Trilliant
ERICSSON
FUJITSU
TELEDYNE DALSA
A Teledyne Technologies Company
grass valley
A BELDEN BRAND

EQUATION FOCUS AREAS



67 M$
Budget **global**

30 M$ Fonds **publics**

37 M$ Fonds **privés**

30
Nouveaux **produits**

23
Nouveaux **procédés**

13
Nouveaux **services**

40+ Partenaires de la **communauté TIC**

EQUATION RESULTS AND IMPACT

PROJECT

PragmaSMART - software solutions to improve management of maintenance operations and construction in infrastructures for smart distribution of electricity, gas and water. Also improves real-time energy efficiency in smart grid operations.

Innovation

- Solution to quickly develop disaster recovery scenarios in smart grids following catastrophic events (e.g. violent storms)

Optimisation

- Work flow sequencing.
- Itineraries for mobile teams.
- GPS and wireless communications.

Environmental impact

- Reduced truck rolls and fuel consumption.
- Reduced GHG emissions.
- Reduced outage times.
- Reduced usage of most polluting energy sources.

PROJECT

Design and development of novel microchip packaging processes that reduce the power, water and chemicals consumed by IBM's largest semiconductor test and packaging centre in the world.

Innovation

- Development of thermal compression bonding techniques that use heat and compression
  to solder materials together with greater efficiency
- Development of eco-friendly deoxydation and soldering processes (reduction of chemical use, elimination of water-based cleaning phase).
- Development of a polymeric encapsulation curing process by microwaves.

Optimisation

- Rework of components on organic modules.
- Optimization of water cleaning methods.

Environmental impact

- Reduction of the use of chemicals.
- Reduction of water and energy consumption.
- Reduction of solid waste (component recovery).

PROJECT

Development of Smart-Grid software tools and equipment open to World markets

Innovation

- Real-time metrology data service on demand allowing utilities to better anticipate demand and optimize the use of multiple energy sources.
- New product line incorporating mesh networking technologies.

Optimisation

- Integration of technologies LGA microelectronic technologies components level) and 4G mobile communications solutions to existing products.

Environmental impact

- Central Maine Power estimates that there will be a reduction of 3.3 million km per year traveled by its fleet of vehicles. This corresponds to a reduction of 1,400 tons of CO_2 emissions.
- Burbank Water & Power Utility is working to integrate solar and wind energy sources to its existing infrastructure.

PROJECT

Fujitsu Innovation Center:
Incubator for Cloud solutions

Innovation

- Big Data processing environment optimized for semantic analysis.
- R & D on a virtual assistant (artificial intelligence).
- Unified Communications as a Service (UCaaS).
- Set-up of a laboratory to test experimental solutions developed in Japan.

Environmental impact

- Significant reduction of travel by the democratization of video conferencing services.
- Extension of at least 1.5x the life of desktops through desktop Cloud service.
- Improvements of our intelligent transportation platform with great environmental potential (↓ C02).

PROJECT

Development of a custom low-power, next generation, integrated optoelectronic switch product for digital optical-fibre communication networks

Innovation

- Optical mechanical and electrostatic MEMS micromirrors modeling tools,.
- MEMS integration strategy with High Voltage ASIC controller.
- High precision prototype demonstrating the new mobile micromirrors technology.

Optimisation

- High performance simulation services for optical MEMS allowing functional prototype of micro mirrors from the first manufactured samples.

Environmental impact

- Development of an ultra-compact, fully integrated optical switch that significantly reduces power consumption and footprint required in Data Centres

PROJECT

Advanced Management Systems for Cable and IP Television Networks

Innovation

- Development of algorithms and techniques to estimate the quality of compressed video streams without the need for full decoding or reference source.

Optimisation

- Optimization of the video stream decoding to allow the Kaleido IP to be the most efficient IP mosaic in the world in terms of simultaneous decoding of compressed streams.
- Combination of the iControl Hypervisor, the mosaic pictures of the Kaleido IP and the EdgeVision probe to reduce the fault detection time normally counted in hours to a few minutes.

Environmental impact

- Remote diagnosis and reduction of number of truck rolls required thus significantly reducing CO_2 emissions due to service calls.

PROJECT

EriCLOUD - *Experimental distributed cloud Infrastructure* for Data Centres

Innovation

- New GHG impact analysis model for Data Centers using a Life Cycle Assessment method.
- New way to distribute processing loads between Data Centers based, among others, on the local characteristics of power generation and temperature.

Environmental impact

- Reduction of energy consumption of Data Centers that will use methods developed during the Equation Green ICT project.
- Reduction of the energy consumed per bit per second transmission between Data Center cabinets using optical technology developed during the Green ICT project

In Conclusion: Celtic Plus – Prompt Partnership

- Objectives :
  - Stimulate collaborative Industry-driven public private R&D partnerships;
  - Common R&D activities in Europe and in Canada, linking industry, universities and research centres;
  - Increase cross-sector activities to impact our citizens and our Industry, both large and SMEs.
- Proposed activities:
  - Increase awareness, share topics, provide services;
  - Facilitate project funding;
  - Common exploitation of test beds.

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Thank you for your attention

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THE NEXT EVOLUTION OF **ICT**
THE NEXT GREAT LEAP FOR **OUR WAY OF LIFE**