



Canada's Association for GeoExchange™

2018 RH&C Meeting

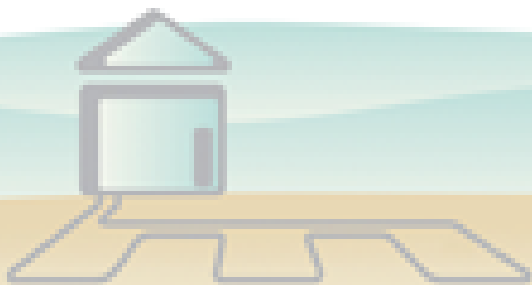
Saratoga Springs NY

Ted Kantrowitz, CEO

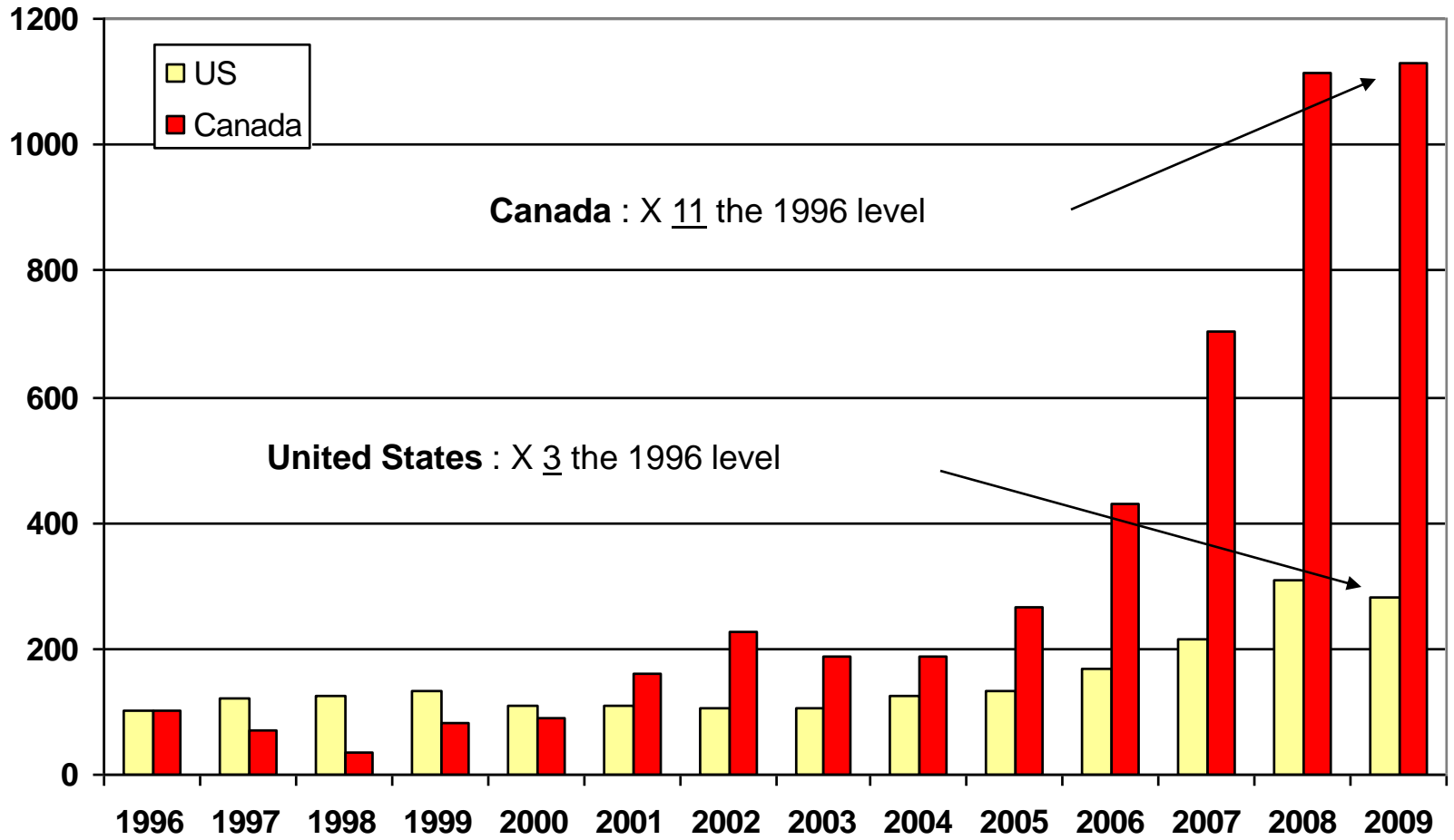


2018 Cumulative / Historical Canadian Market Context

19 305	<i>CGC-certified residential geexchange systems</i>
4 354	<i>trained individuals</i>
687	<i>accredited installers</i>
482	<i>accredited residential designers</i>
442	<i>qualified companies</i>
300+	<i>members</i>
22	<i>college partners</i>
15	<i>board positions</i>
10	<i>provincial caucuses</i>
7	<i>fully developed training courses</i>
1	<i>strong and representative national association!</i>

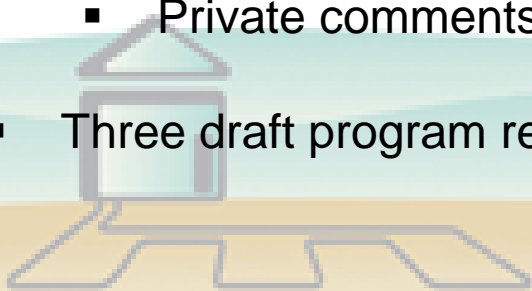


Geothermal Heat Pump Installations Per Capita (Units per 100,000 inhabitants)



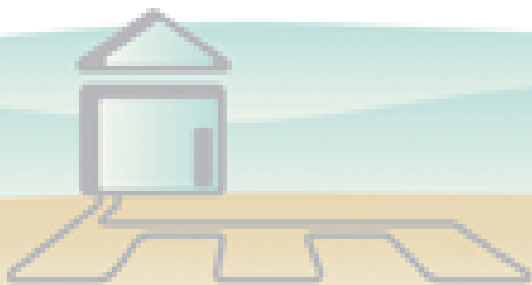
How did CGC and partners do it?

- A decade of consultations from NRCan, utilities, CGC
- Open RFP Process for training development – Sept 2005
- Study to assess whether & which stakeholders would benefit from a quality programme – early 2006
 - Long term health of the industry – reputation issues
 - Avoid the boom-bust subsidy effect and ‘little mushrooms’
 - Protect consumers, boost competition, grow the pie
 - Possibly help unite the industry
- Report and staff recommendation, CGC Board Resolution
- National Public Consultation – June 2006
 - Copy to multiple ministries in each government
 - Private comments from CGC members and major stakeholders
- Three draft program releases, comment, revisions, then final release

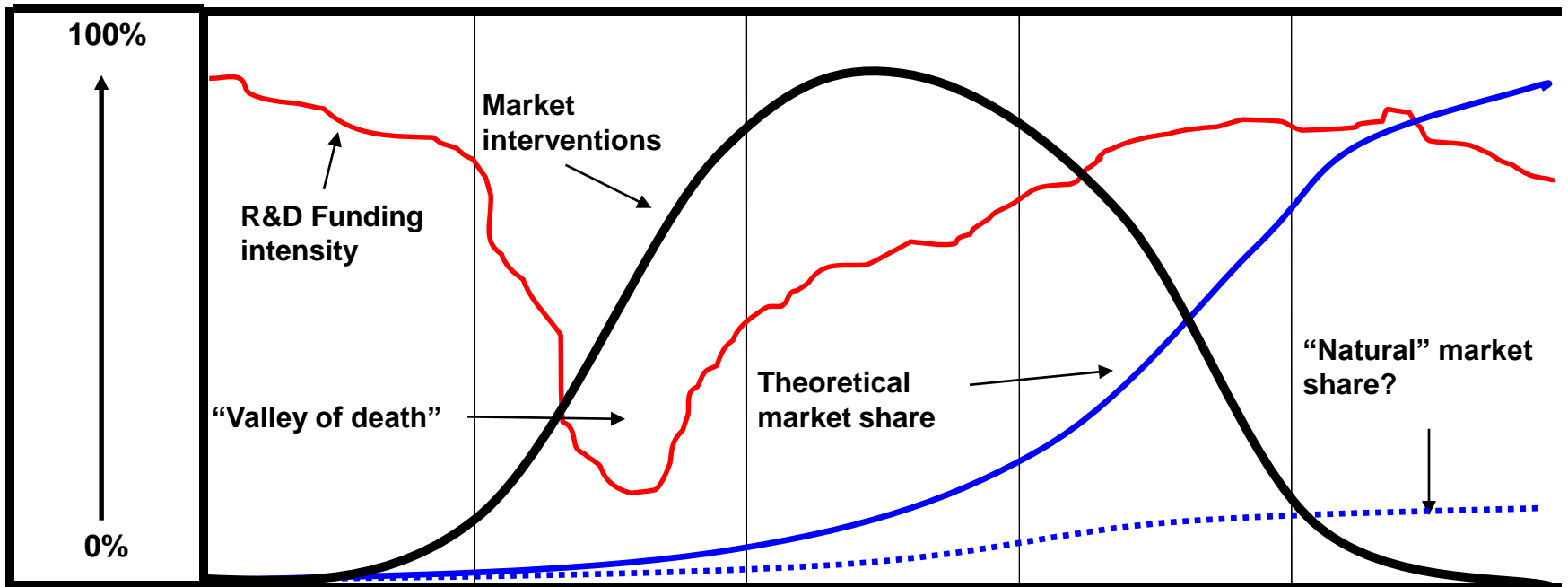


Industry Infrastructure partly means: CGC Market Transformation Initiative

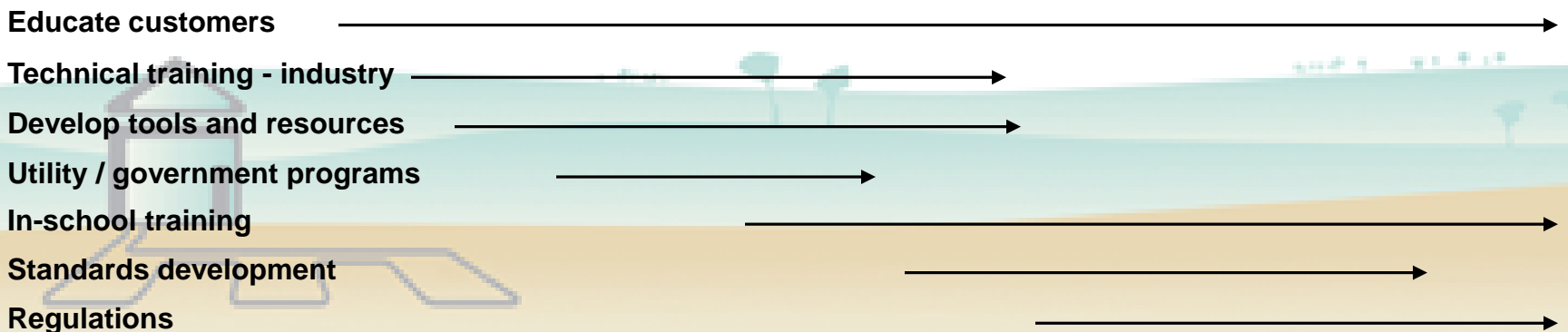
- Market transformation infrastructure to support anticipated industry growth
- Create a strong and ***even more*** professional geoservice industry through training programs and partnerships – building a labour force
- Keep financial resources (training revenue) in Canada and reinvest those financial resources to support services (QA, other) to the industry
- QA programs and partnerships – building a labour force
- “The same thinking that got us here won’t get us where we’re going”
- Create the necessary mechanisms for this industry to play a major role as a renewable and reliable energy source across regions and country



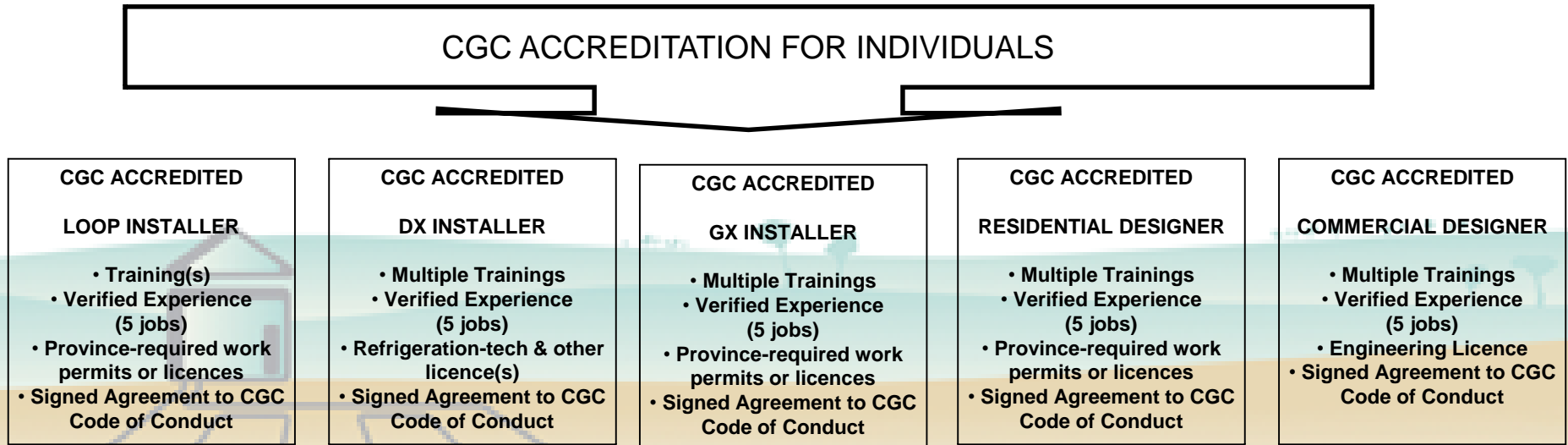
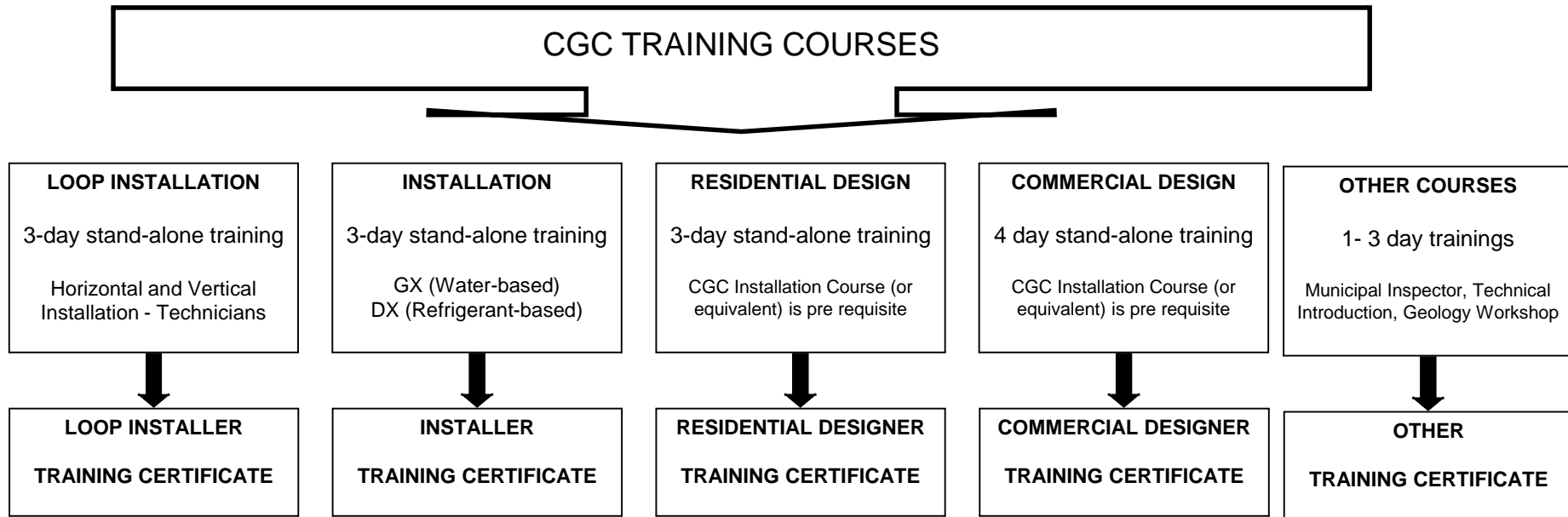
Technology Adoption Lifecycle



Phase	1 - Pilot	2- Program	3 - Commercialise	4 - Propagate	5 - Maintain
Goal	Raise Awareness	Demonstration	Remove Barriers	Transform Market	Sustain Market
Market	Innovator	Early Adopter	Early Majority	Late Majority	Laggards



Quality Program Flow



Quality Program Flow

CGC QUALIFICATION FOR FIRMS

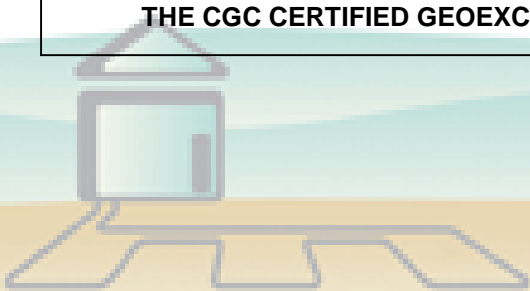
FIRMS ARE REVIEWED + QUALIFIED, WORK WITH CGC ACCREDITED PROFESSIONALS

CERTIFICATION OF SYSTEMS

SYSTEM IS REVIEWED FOR TECHNICAL AND ADMINISTRATIVE COMPLIANCE, MEETS OR EXCEEDS ALL REGULATIONS AND CGC BEST PRACTISE REQUIREMENTS, AND IS CERTIFIED BY THE CGC

GRANTS, FINANCING, INSURANCE, OTHER PROGRAMS

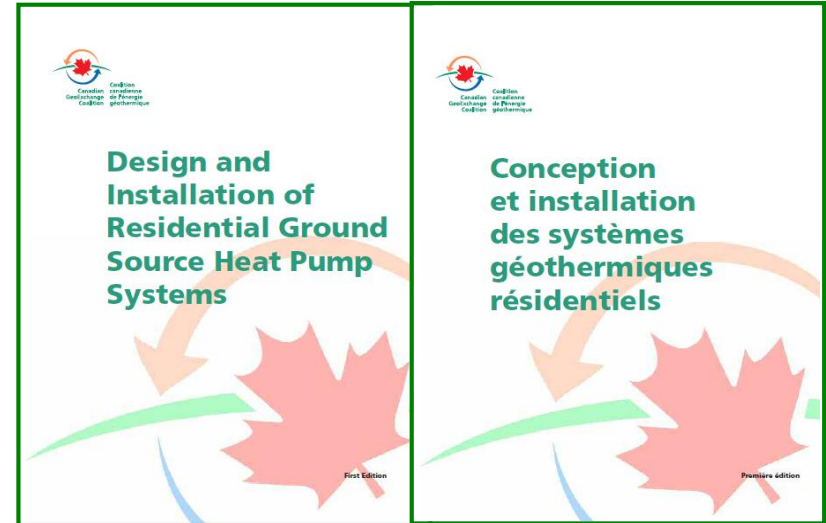

THE CGC CERTIFIED GEOEXCHANGE SYSTEM IS ELIGIBLE FOR GRANTS AND OTHER PROGRAMS



Training and Industry Tools

Municipal Toolkit

1. Inspector's routine & templates
2. Sample Bylaw
3. Policy Roadmap for Municipal Policymakers
4. Original GeoAnalyser.com software

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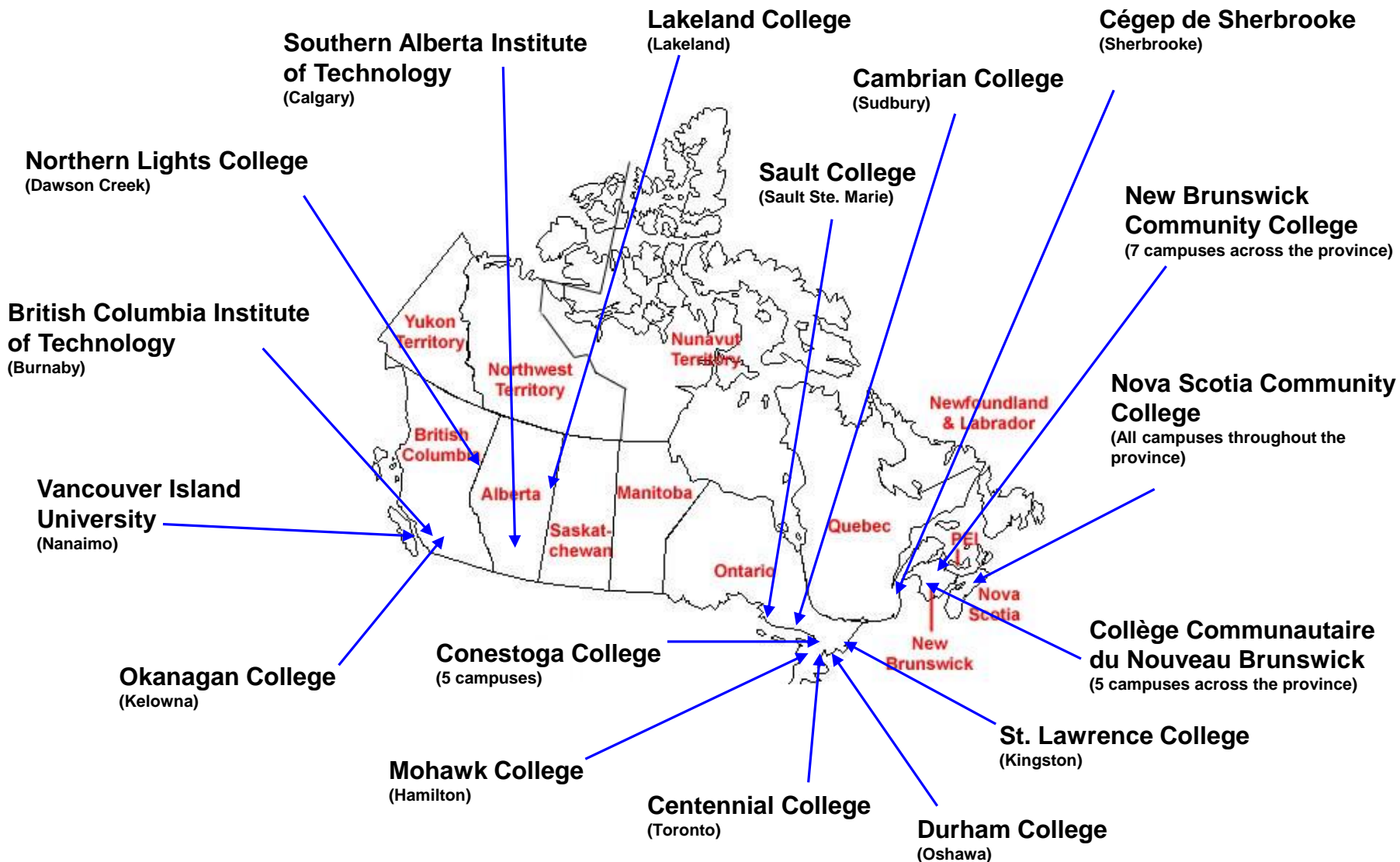
Video Demo Free 30 Day Trial Connect Here



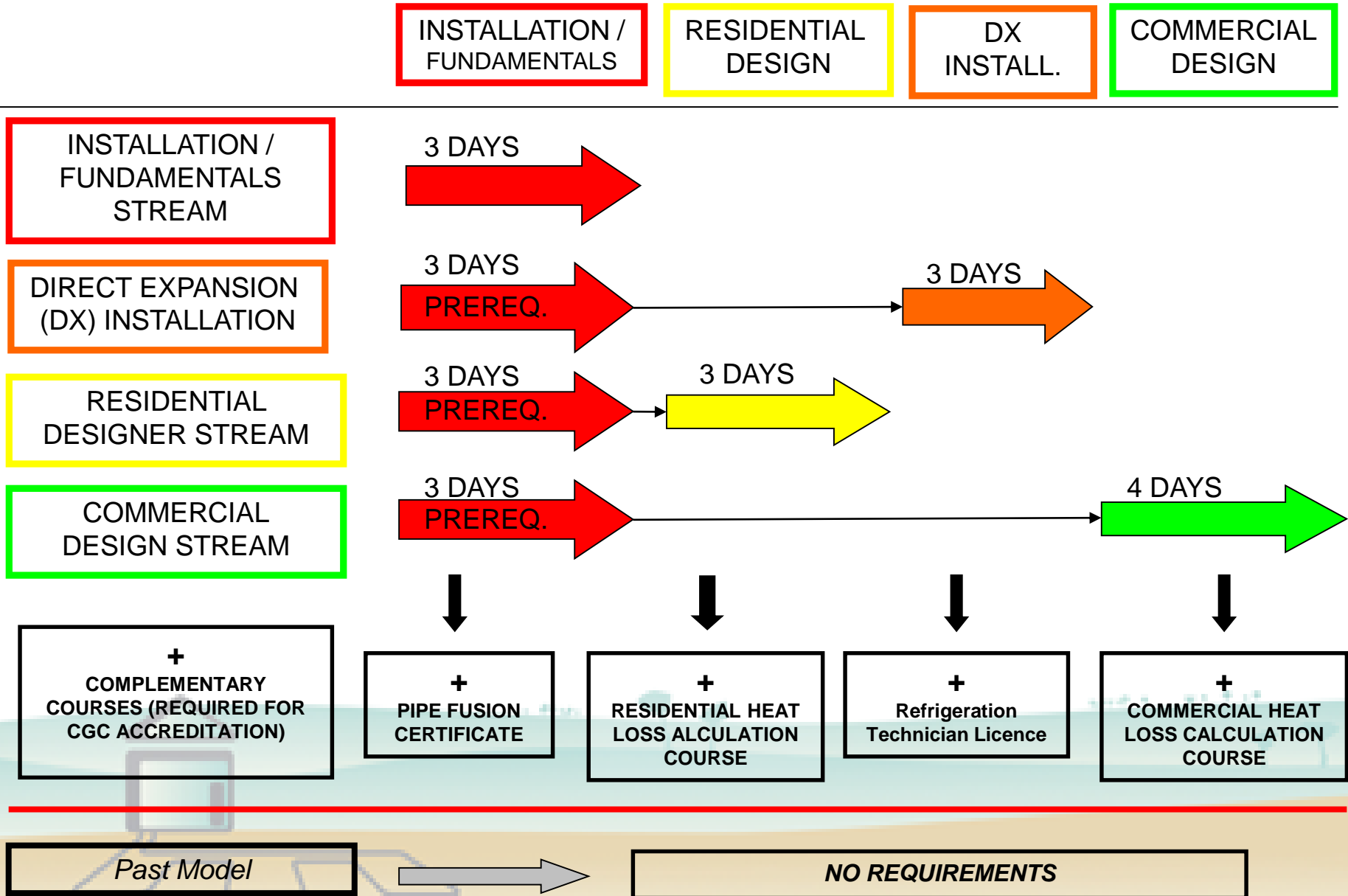
Municipal
Inspector's Course
for GeoExchange
Systems®

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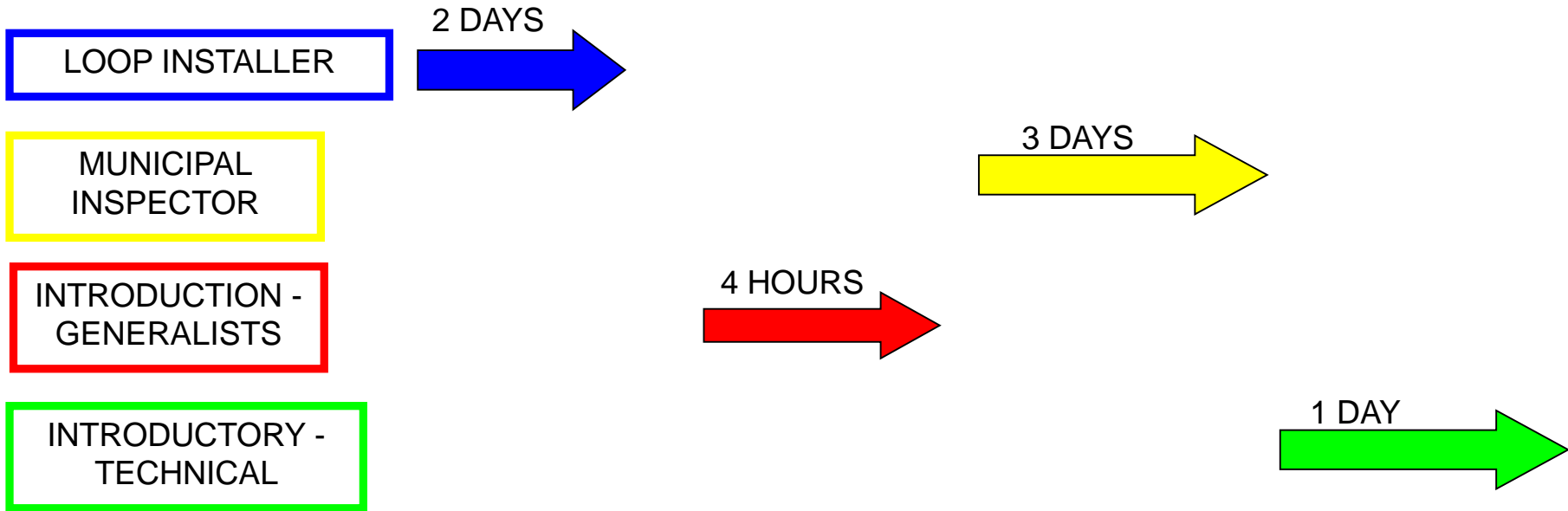
CGC Education and Training Network



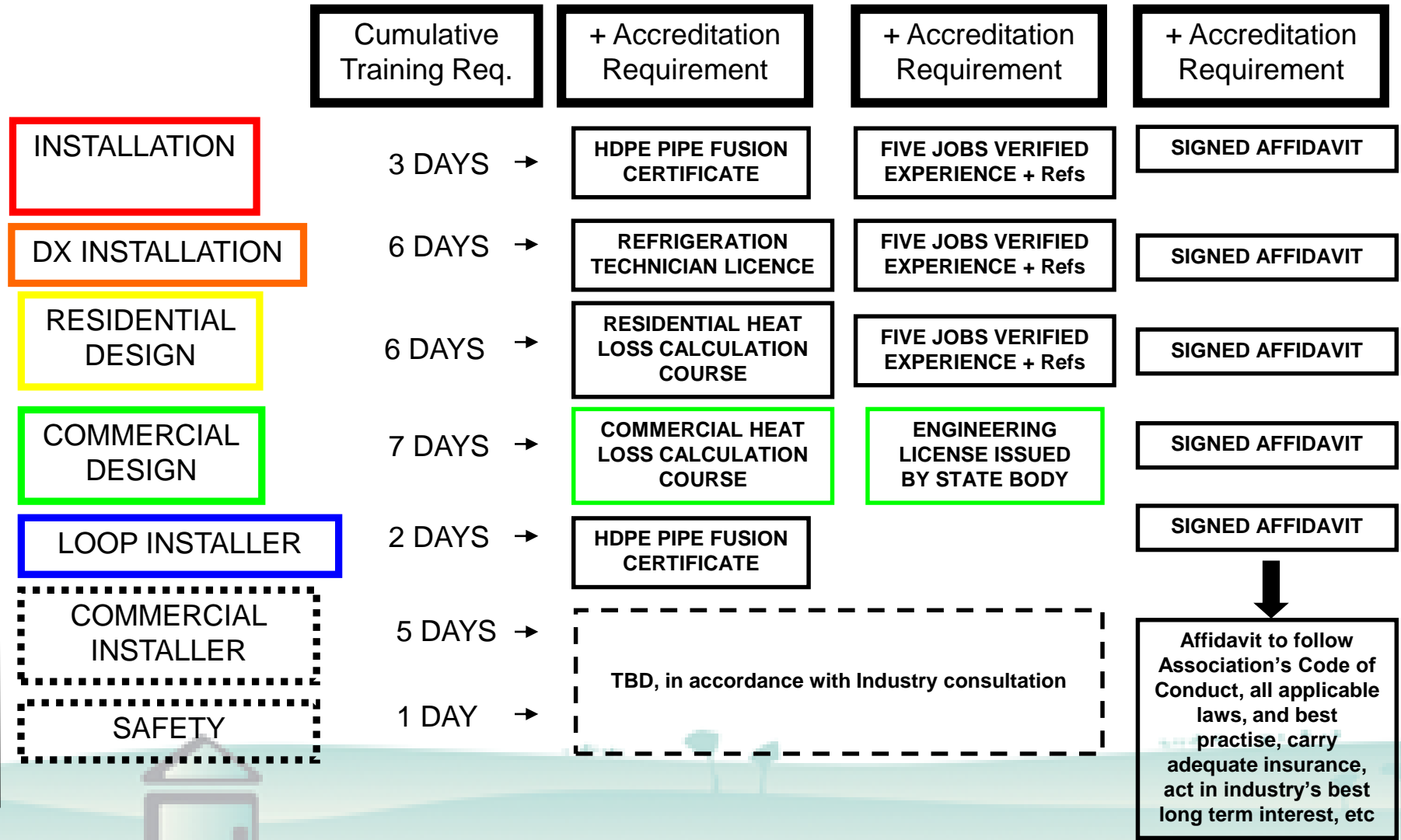
Comparative – Training Programs – Canada vs the Past



Comparison – Additional Training Options – Canada vs Past



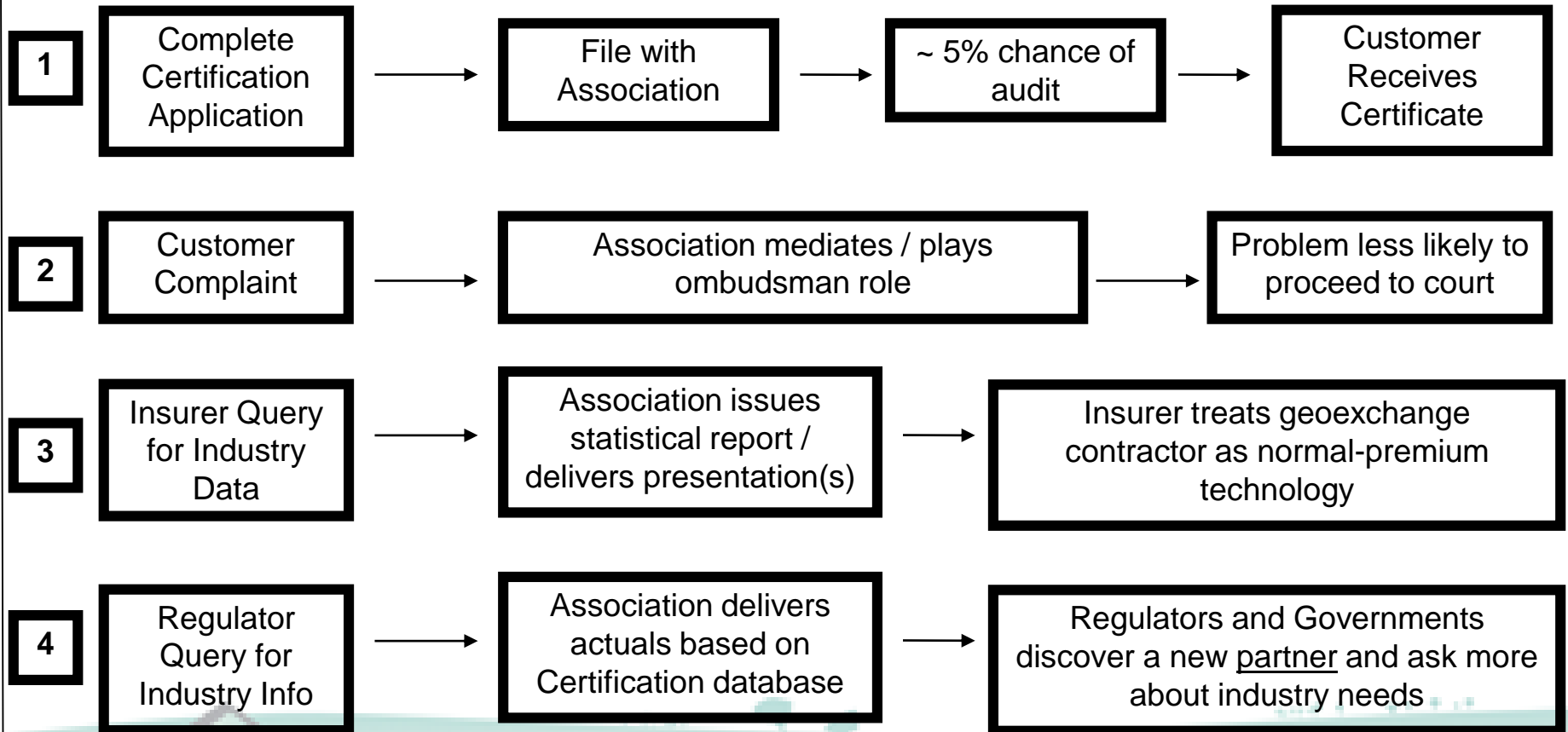
Comparison – Accreditation – Canada vs the Past



Past Model → NO REQUIREMENTS, SUPERVISION, OR POST-ACCREDITATION FOLLOW UP; BOOM AND BUST INDUSTRY CYCLE

Comparison – System Certification – Value Delivery

Some typical scenarios under Canada / CGC Model

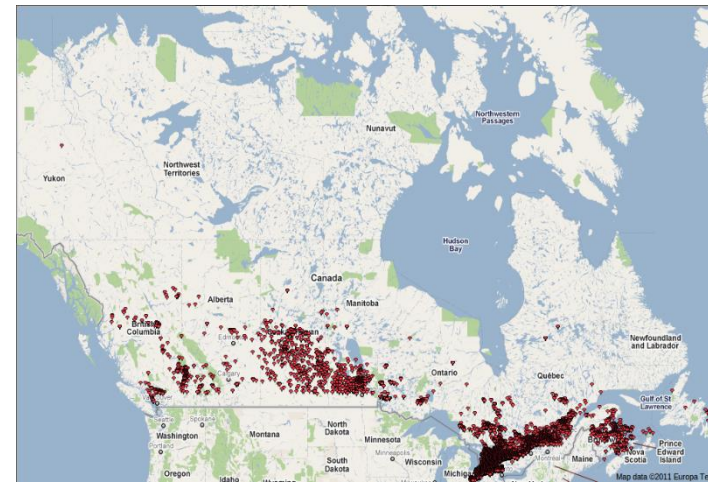
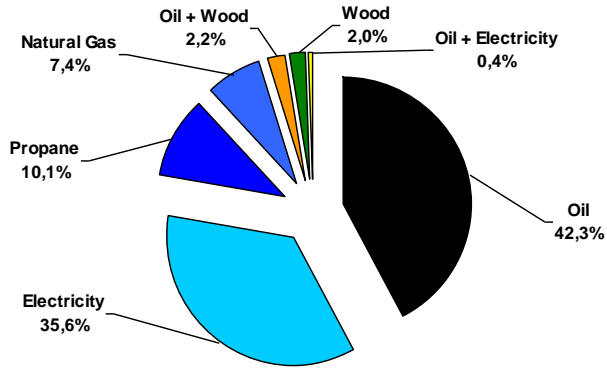


Past Model

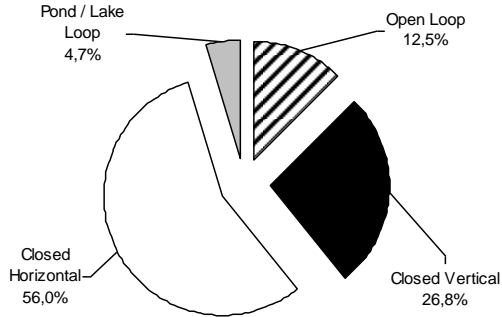
NO REQUIREMENTS, SUPERVISION, OR POST-ACCREDITATION FOLLOW UP; BOOM AND BUST INDUSTRY CYCLE; NO QUALITY PROGRAM BENEFITS, ALL IN PURSUIT OF CHEAPEST SHORT TERM

Quality Program Delivers Data

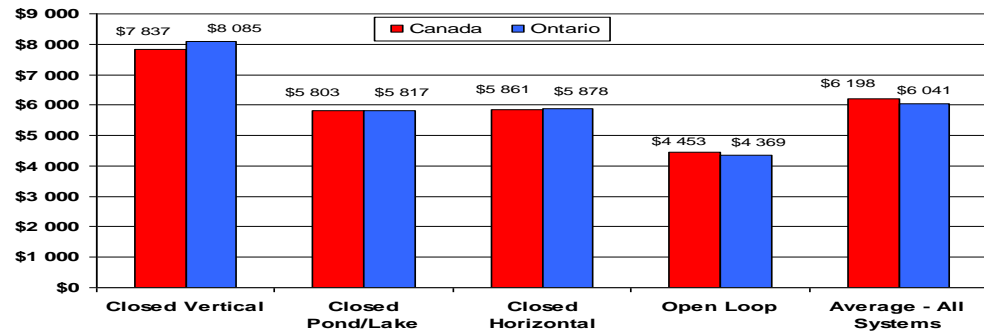
System Retrofits - Fuel Replaced (Canada)



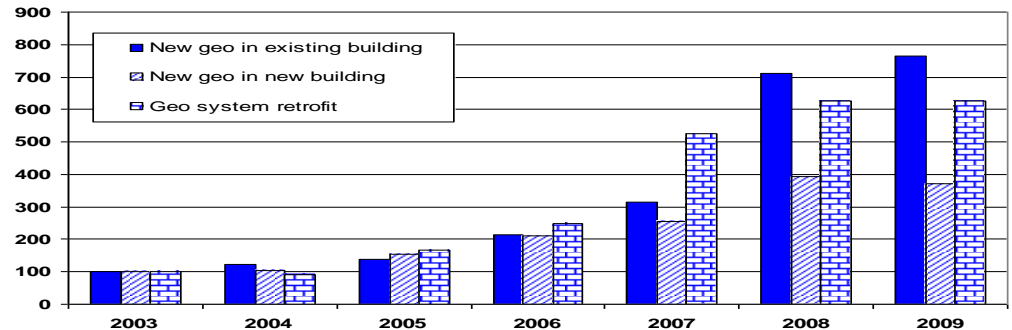
Geoexchange Systems By Loop Type Canada



Average Residential System Price per Ton (Retrofits)



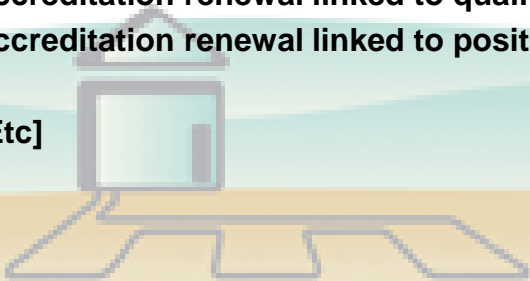
Types of installations (2003 = 100)



Source: Canadian GeoExchange Coalition

Comparative Analysis – Training and Installers Accreditation

	CGC Model	Past Model
✓ Specialized separate training for drillers, installers and designers	yes	no
✓ In-class training harmonized for all trainers / quality controlled	yes	no
✓ Training material fully adapted to region's regulations	yes	no
✓ Trainers selected based on their professional credentials	yes	no
✓ Trainers and training linked to Canada's trade-education system	yes	no
✓ Training materials aligned with National Occupational Standards	yes	no
✓ Trainers participate in ongoing discussion on training improvement	yes	no
✓ Automatic accreditation with training	no	yes
✓ Accreditation requires professional references	yes	no
✓ Accreditation requires verified field experience and performance	yes	no
✓ Accreditation requires supervision for first installations	yes	no
✓ Accreditation requires appropriate work permits and licenses	yes	no
✓ Accreditation renewal linked to compulsory membership	no	yes
✓ Accreditation renewal linked to conference attendance	no	yes
✓ Accreditation renewal linked to quality work and performance	yes	no
✓ Accreditation renewal linked to positive customer feedback	yes	no
✓ [Etc]		



Comparative Analysis – Industry Association Perspective

	CGC Model	Past Model
✓ Individual trainer can keep class 'profit' after expenses	no	yes
✓ Industry training revenues stay in country / state	yes	no
✓ Training revenues go to build national industry association services	yes	no
✓ Quality program revenues build national industry association services	yes	no
✓ Training courses reflect Canadian geology & climate	yes	no
✓ Training courses reflect Canadian regulation and standards	yes	no
✓ National industry controls national standards and training	yes	no
✓ Quality program materials reflect industry needs	yes	no
✓ Training is improved annually / on demand	yes	no
✓ Improved image for industry & lower insurance rates	yes	no
✓ Lowered transaction costs for overall industry	yes	no
✓ Honest contractors / designers better protected from the dishonest	yes	no
✓ Accreditation linked to a complaint management mechanism	yes	no
✓ Association serves as ombudsman and helps industry long-term	yes	no
✓ Accreditation linked to a Code of Conduct enforcement	yes	no
✓ Industry association adds value for governments	yes	no
✓ Industry association adds value for industry	yes	no
✓ Industry association adds value for end-use customers	yes	no
✓ Etc....		

Market Structure Experiences

Laissez-faire

Assoc Functions Left to Individual Companies

Inertia

- Transaction costs high for each player
- Conflicting or confusing messages to government and consumers
- Industry driven by individual growth and fight for market share in a flat market
- Attempts to control the market

Market Transformation

Programme as base for a National Assoc. and Effort

Industry Leadership

- Fair & national leadership asserted, change constant
- Raising the bar in a continuous process
- Organised, forward-looking leadership
- Collective industry growth and relative positioning in growing market
- Markets will change; industry creates its own momentum

Fully Regulated

~90% Handled by State

Dependence

- Usually centralised, standards and regs first
- Much depends on regulator competence and involvement
- Limited: Much depends on extant stakeholders / infrastructure
- Consultation and decisions often directly affected by political winds / whims.

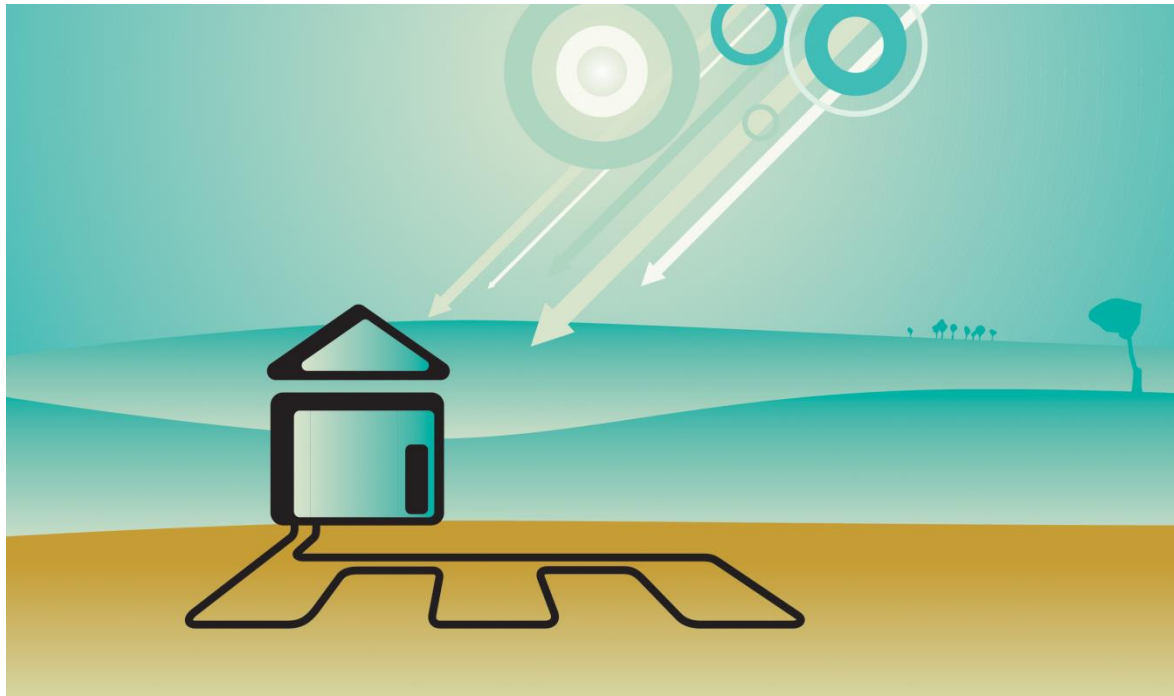
Our ultimate goals

- Work with industry professionals and partners to grow the industry in a financially sustainable manner, in Canada and abroad.
- Build and disseminate as many tools to the smaller / medium-sized contractor as possible – enable the small guy to offer big services.
- CGC College partners train, rather than private trainers, and build a workforce rather than simple training.
- Maintain control over Canada's quality program and develop it / bolster it
- Bring in more conventional HVAC / R companies via education channels
- Raise international cooperation, fair and cooperative exchange, and bring in more stakeholders to build competition for heat pump tech.



Merci / धन्यवाद / 감사합니다 /
תודה / شكرا لك / Thank you!

www.geoexchange.ca



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