# RemTech 2005

## Implementing Environmentally-Sound Technology through Benchmarking and Verification

October 2005

etv canada

# ETV Canada…

- Not-for-profit organization
- Part of OCETA and the network of Canadian Environmental Technology Centres (CETACs)
- Licensee of the Government of Canada Environmental Technology Verification Program
- Strategically positioned to manage the preparation of credible performance guidelines, screening methods and verification protocols for technologies, projects and programs

- Use of unproven technologies with potentially significant environmental impacts is a major concern

- To meet sustainable development objectives, need to:

  - define a process for assessing the environmental characteristics, benefits and risks associated with technologies, infrastructure, projects and programs

  - improve and strengthen the capacity of administrators and decision-makers to identify, evaluate and implement environmentally sound solutions

# The Challenge

- Increased accountability to stakeholders has prompted the need for independent transparent reporting of performance information

- Appropriate tools and processes are needed for credible evaluation and verification of environmental performance

- Third-party verification is proven assessment mechanism for determining performance with a high level of reliability

✔ To help address these challenges, ETV Canada is implementing, a **3-Part Strategy** consisting of:

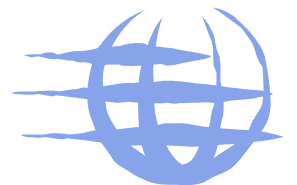#1. Performance Benchmarking
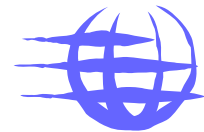
#2. Technology Verification

#3. Harmonization and Cooperation

# #1 Performance Benchmarking

- A management process and decision-support tool designed to provide reliable and verifiable information to determine whether or not environmental performance meets accepted criteria

- A central element is the identification of achievable targets or standards upon which verifiable performance criteria can be based

- Can be used in support of sector and program initiatives to improve environmental and sustainability performance
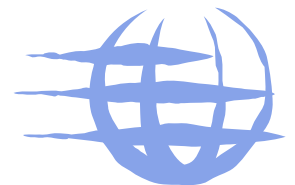
# Performance Benchmarking

- An effective screening and assessment tool for augmenting the capacity of decision-makers to make informed decisions

- Ultimate goal - to identify suitable environmentally sound solutions through comprehensive assessment based upon established criteria and recognized technical protocols incorporating sound scientific and statistical analysis
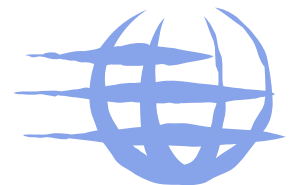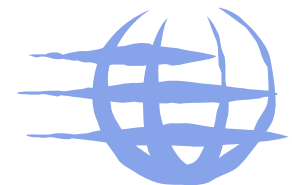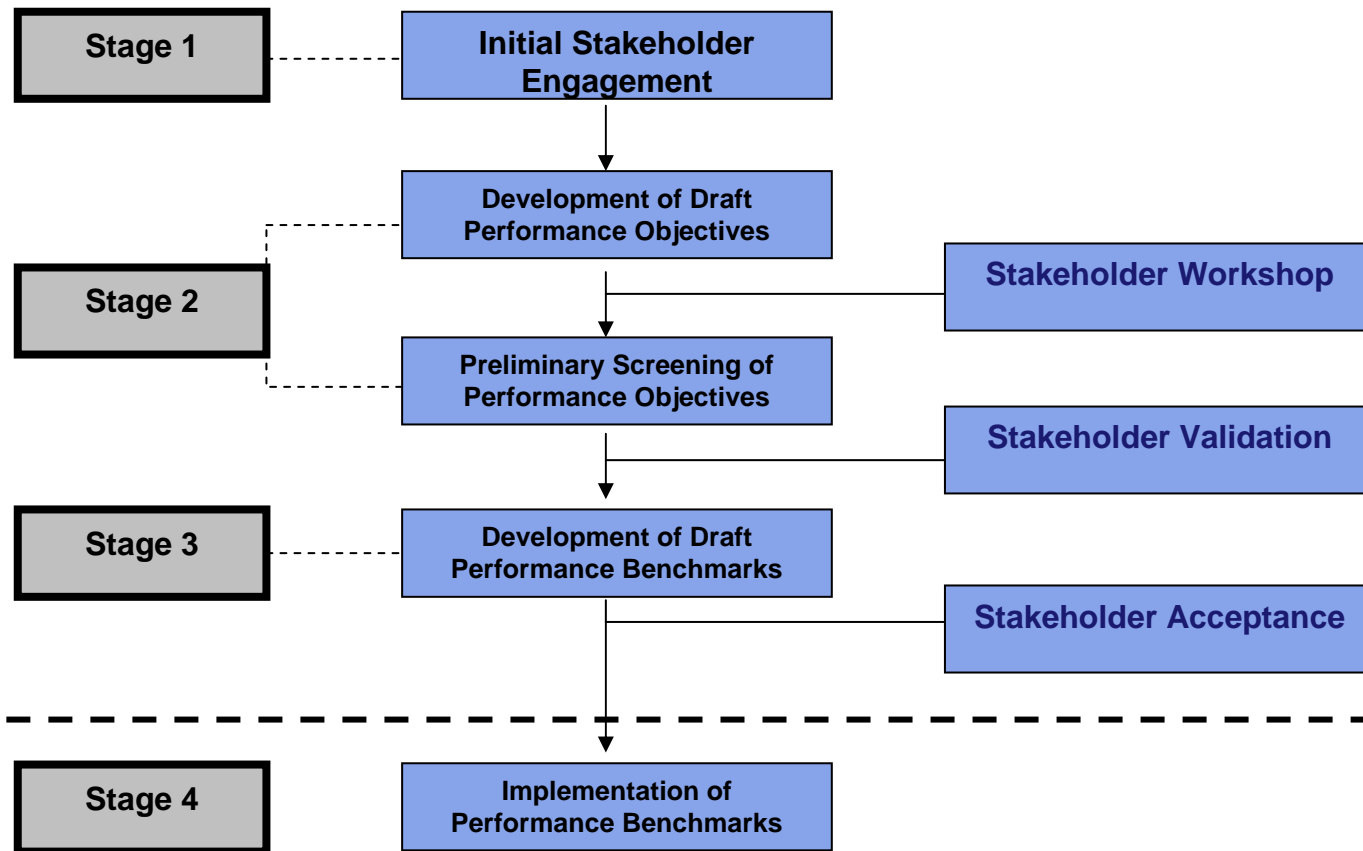
# Performance Benchmarking

- Benchmarking to must be driven by motivated stakeholders

- Gaining support can be challenging –
  - significant energy, time and resources are required to collect, process and analyze data, and then to implement performance improvements

- Working with a range of stakeholders through a transparent framework using accepted methodologies, helps legitimize environmental performance improvements at multiple levels

# Performance Benchmarking Process

| Stage 1 | --- | **Initial Stakeholder Engagement** |
|---------|-----|------------------------------------|

**Development of Draft Performance Objectives**

**Stakeholder Workshop**

| Stage 2 |

**Preliminary Screening of Performance Objectives**

**Stakeholder Validation**

| Stage 3 | --- | **Development of Draft Performance Benchmarks** |

**Stakeholder Acceptance**

| Stage 4 | **Implementation of Performance Benchmarks** |

## Stage 1: Stakeholder engagement

- Starts with review and consolidation of current experience followed by a multi-stakeholder consensus-building process to identify an initial set of acceptable performance criteria

- Done in association with government agencies, academic institutions, industry, NGOs and other key stakeholders thus ensuring local involvement and ownership of the process
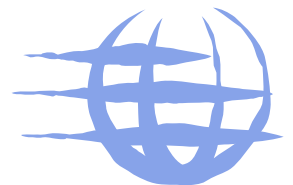
**Stage 2: Multi-stakeholder workshop**

- Initial criteria from Stage 1 discussed in workshop

- Final set of criteria for screening, assessing and verifying performance emerges

- In addition to environmental and technical, criteria typically include social, cultural, economic and other parameters which may impact user acceptability
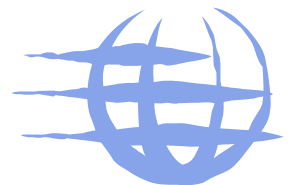
## Stage 3: Stakeholder validation

- All criteria under review are ultimately weighted against the realities of stakeholders to ensure that they can be implemented and sustained

- Proposed "solutions" screened against accepted criteria which include both quantitative and qualitative parameters

- Screening done by qualified representatives from government, academia, international agencies and local NGOs, and in some cases includes outside experts
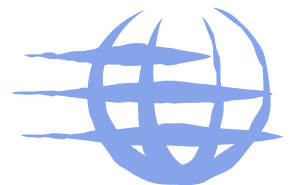
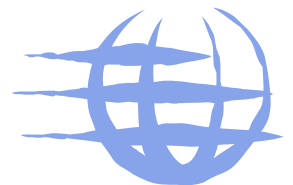## Stage 4: Implementation

- Candidate solutions undergo assessment by an independent third party

- To validate performance and minimize risk, testing protocols are based on the previously established core criteria

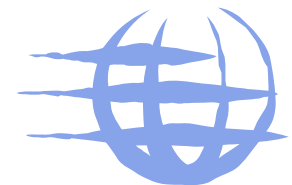- Verification can then take place against performance criteria which reflect stakeholder needs
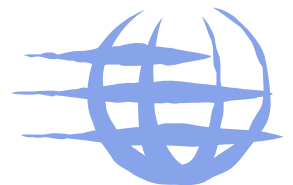
**Linking Performance Benchmarking and Verification:**

- Engagement with key sectors to identify priority issues and performance objectives

- Development of implementation options, including technologies and process modifications

- Verification against performance objectives

- Facilitation of informed decisions – both government and industry

**Performance Benchmarking Stages 1,2,3**

**Performance Benchmarking Stage 4**

**Performance Verification (ETV Process)**

**Screening**

Testing Protocol

Data Collection

**Verification**

**Market Application of Verified Technologies**
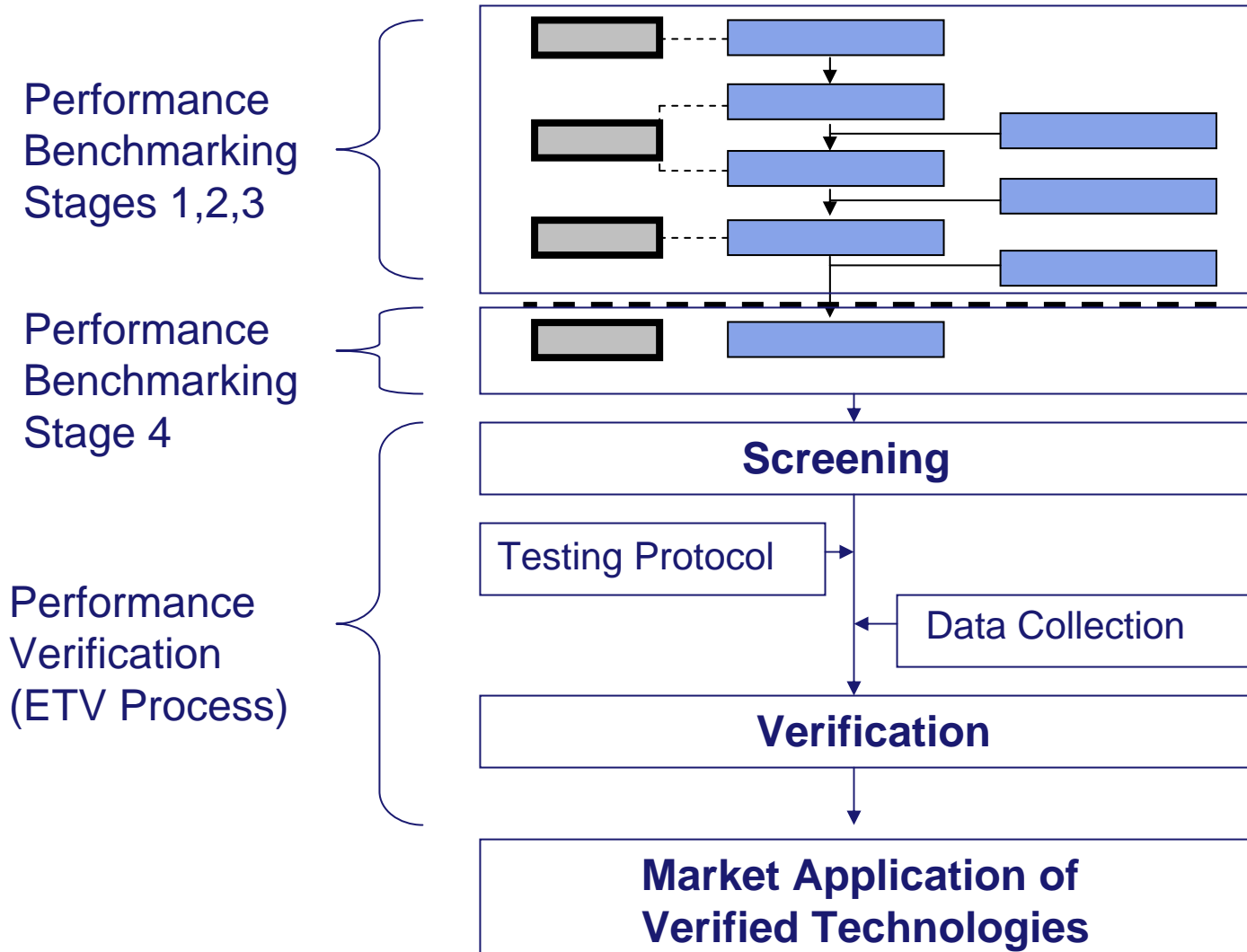
# Performance Benchmarking Benefits

- Establishment of appropriate institutional mechanisms through which environmental performance can be evaluated
  - Can be used at the local level to establish a process for evaluating options in relation to environmental quality improvements
- Building core capacity within scientific and technical organizations to independently assess and evaluate proposed options
  - Local expertise and infrastructure can be strengthened through related institutional capacity building and training
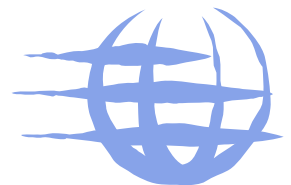
# Performance Benchmarking Benefits

- Mobilization of financial resources and facilitation of appropriate investment
  - Working with financial institutions on performance evaluation in order to bring confidence to investors, by characterizing and quantifying risk
- Creation of a culture of innovation
  - Integrating core elements of capacity building, information and knowledge management
- Avoids duplication by linking to existing support systems and initiatives
  - Facilitating participation of private and public stakeholders, including business, legal, financial, and other service providers
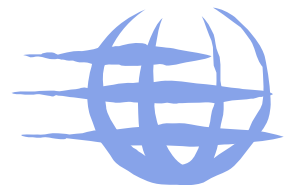
# Performance Benchmarking Benefits

- Helps evaluate the appropriateness and applicability of options taking into account needs of stakeholders
  - Use of comprehensive assessment protocols helps determine strengths and weaknesses of candidate solutions under operational conditions
- Link to national and international organizations Involved in EST development and deployment
  - Important in ensuring that sector-specific Performance Benchmarking procedures and protocols are internationally recognized
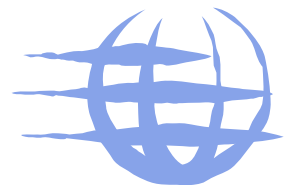
Performance benchmarking helps:

- Stakeholders focus the identification and qualification of relevant performance criteria
- Solution providers focus their development efforts in response to market realities
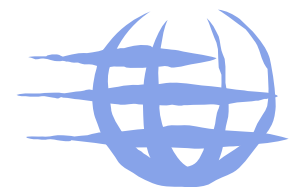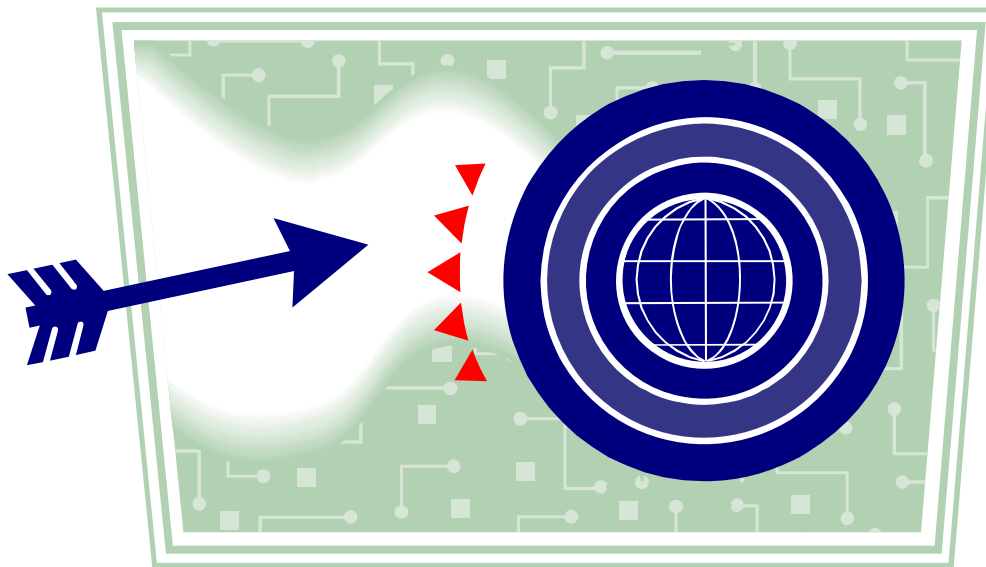
# Performance Benchmarking Examples

- ## National
  - Manure Management Technology Performance Verification Program
- ## International
  - Environmental Technology Verification – Arsenic Mitigation Program in Bangladesh (ETV – AM)
- ## Active interest
  - Canadian Association of Municipal Fleet Managers (CAMFM)
  - GHG Technology Actions
  - Water Quality
  - Green Infrastructure
  - Contaminated Site Remediation
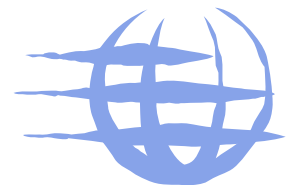
**Environment Canada / Industry Canada -**

- ✔ established the Canadian Environmental Technology Verification Program in 1997
- ✔ funded the development of the initial verification program intellectual property and assessment protocols

**Scope includes -**

- ✔ Environmental performance verification of a broad range of production and consumption technologies (not just "environmental" technologies)

# Canadian ETV Program

- Supports the **development** and **promotion** of new environmentally-sound technologies
- Provides technology purchasers with **independently verified data** to augment purchasing decisions
- Provides regulatory agencies and industry sectors with a process and data to help qualify available technologies for **solving environmental problems**

- ✔ 3$^{rd}$- party independent verification of performance to reduce subjectivity and conflict of interest

- ✔ Part of a national process, recognized by most Provinces, with sector specific technology performance standards and **independent verification**

# Characterizing Technologies

**CONTAMINANT
CHARACTERISTICS**

**CONTAMINANT
SOURCES**

**CONTAMINANT
RECEPTORS**

**TECHNOLOGIES**
- **Prevention**
- **Control**
- **Remediation**
- **Measurement**

# Technology Verification

**Involves:**

- Working closely with technology innovators and qualified testing organizations

**Incorporates:**

- Test methods relevant to the specific features and performance characteristics of the technology being verified

- A distributed network of Verification Entities (VEs) selected on the basis of their technology expertise and independence

# Selection of Verification Entities

**LABORATORIES ACCREDITED BY STANDARDS COUNCIL OF CANADA**

**NATIONAL LABORATORIES**

**UNIVERSITIES**

**EXPERTS**

# Technology Verification Process

| | |
|---|---|
| **Company with Technology** | **Testing (by Accredited Laboratory)** |
| **Pre-Screening Application** | Full Confidentiality Chain of Custody No Conflict of Interest |
| **Formal Application** | |
| **Selection of Verification Entity** | |
| **Verification Contract** | |
| **Verification (against GVP)** | **Test Data Submitted** |
| **Reporting & Award** | |
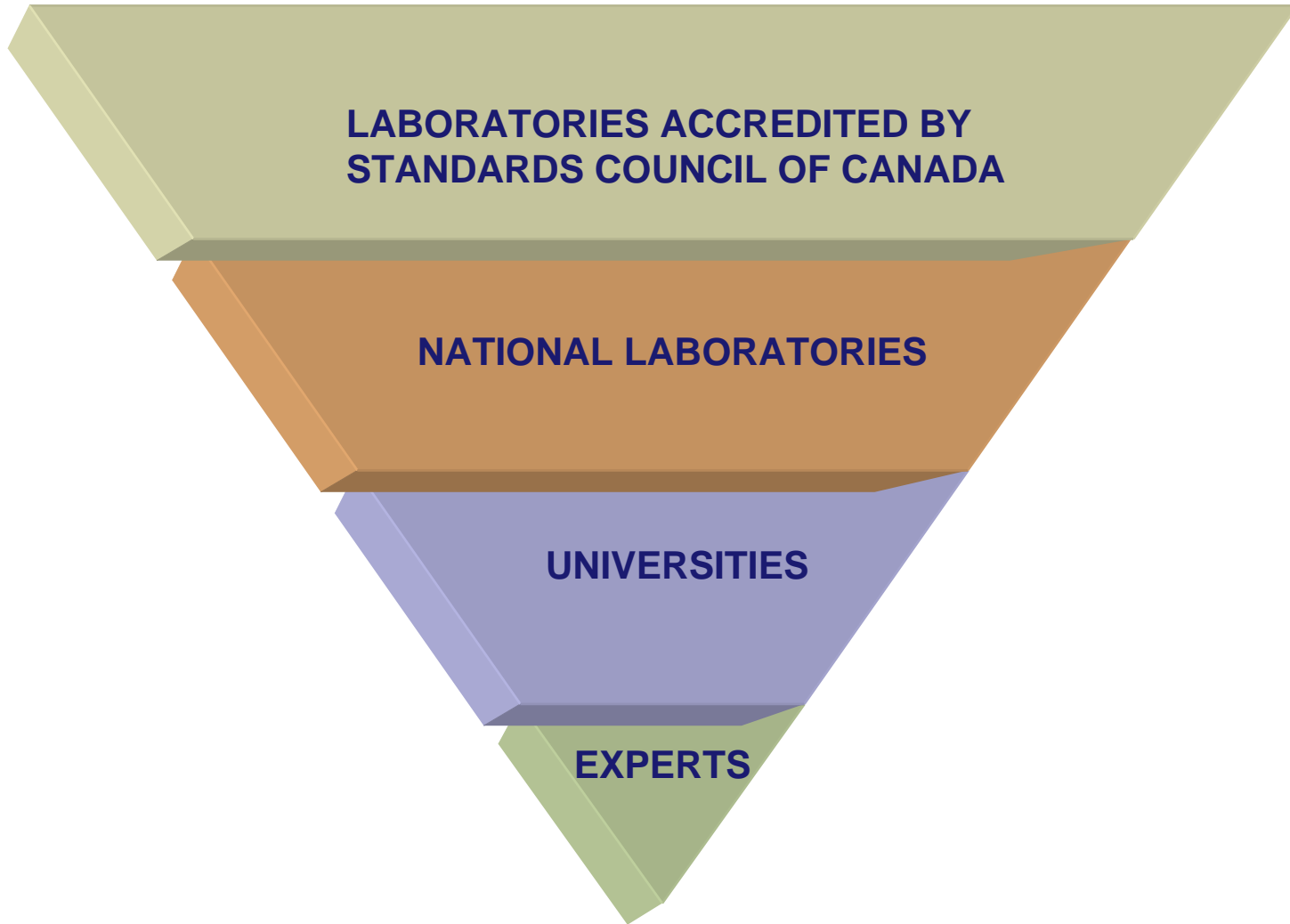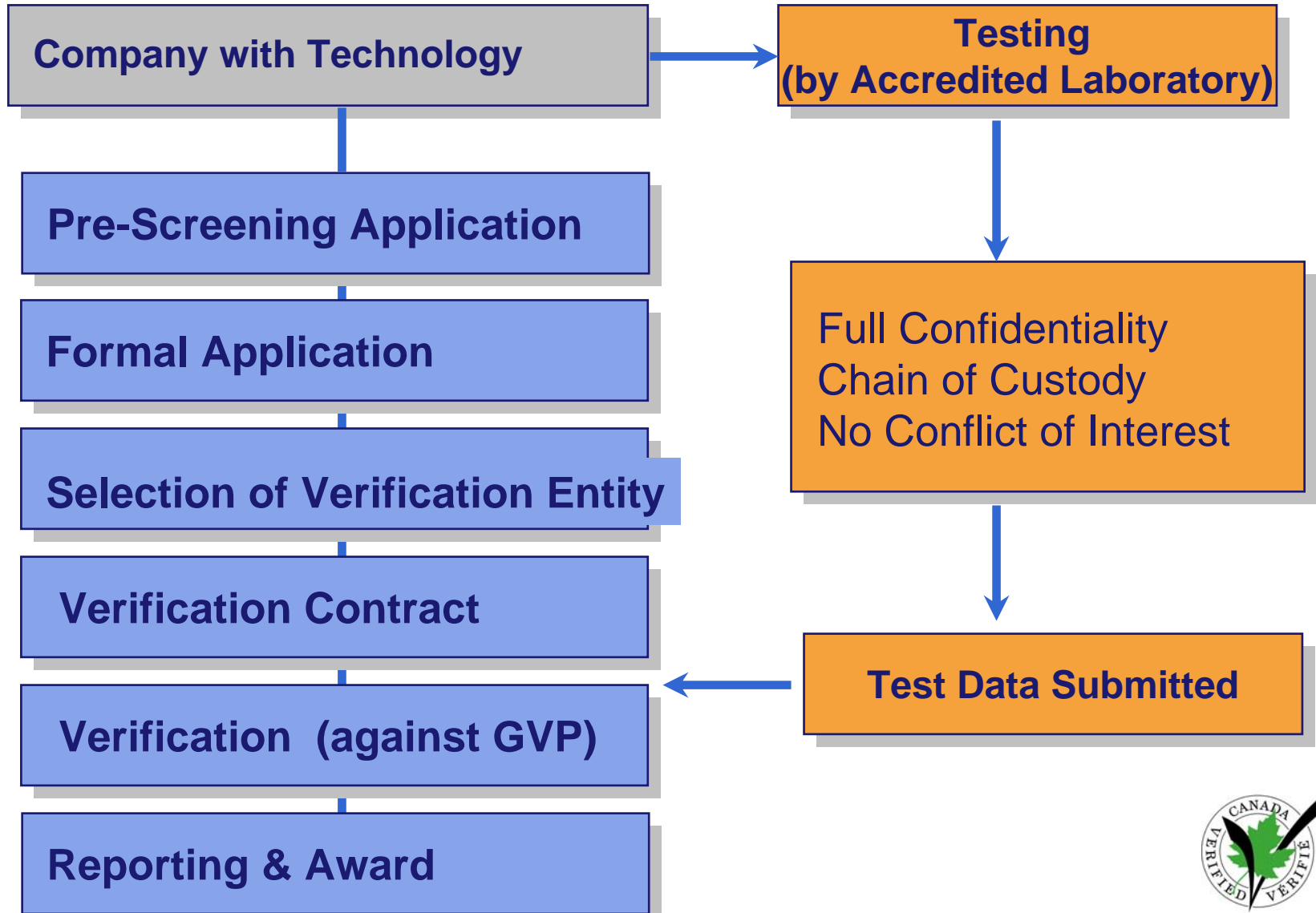
# Technology Verification

**All technologies:**

- ✔ Based on sound scientific and technical principles supported by peer-review-quality technical literature and references

- ✔ Demonstrate environmental benefits

- ✔ Comply with all Federal and Provincial regulations, including health and safety standards

- ✔ Reflect operational realities

# Technology Verification

**All verifications:**

- ✔ Require sufficiently complete and representative baseline operational data

- ✔ Must be independent and third-party witnessed

- ✔ Document quality assurance/quality control procedures with "chain-of-custody" throughout

- ✔ Demonstrate statistical significance with a 95% confidence level or better

- ✔ Comply with the ETV Canada generic verification protocol

**Other key features:**

- Complementary Environmental Technology Demonstration Assessment Program (ETDAP) helps companies develop and implement an effective test plan

- ETDAP provides:
  - an assessment of the competitive position and a market advantage of the technology
  - a Technology Specific Test Plan (TSTP) and data gathering roadmap

# Types of Verification Clients
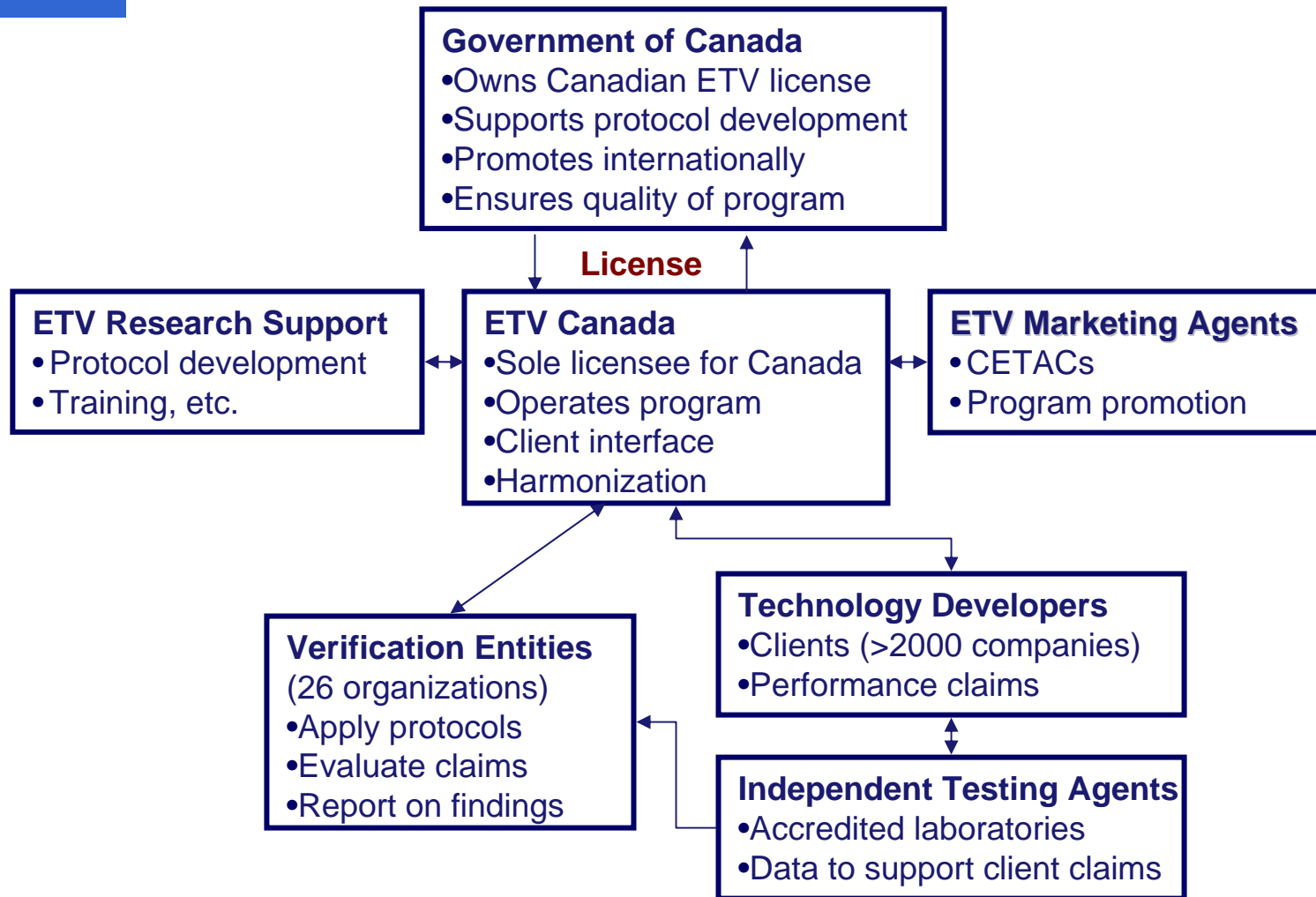
Technology companies:

1 - With complete data sets

2 – With data sets needing clarification/augmentation

3 – Needing to modify their performance claims

4 – Requiring technology/market assessment (ETDAP)
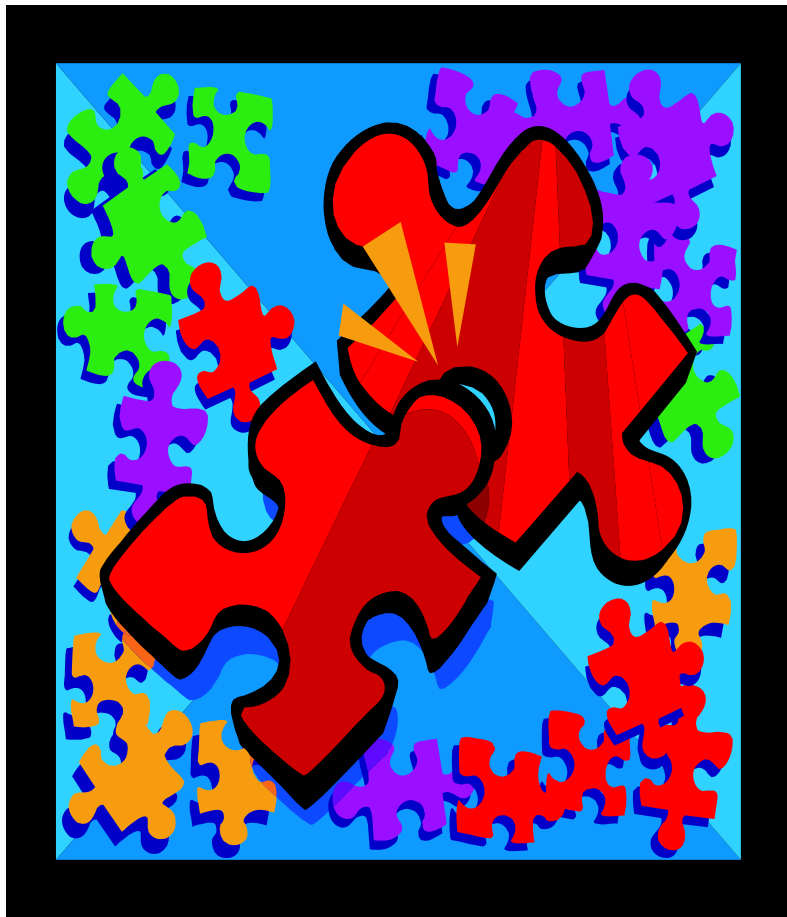
5 – Requiring new protocol development

# ETV Canada's Distributed Delivery Approach

**Government of Canada**
- Owns Canadian ETV license
- Supports protocol development
- Promotes internationally
- Ensures quality of program

**License**

**ETV Research Support**
- Protocol development
- Training, etc.

**ETV Canada**
- Sole licensee for Canada
- Operates program
- Client interface
- Harmonization

**ETV Marketing Agents**
- CETACs
- Program promotion

**Verification Entities**
(26 organizations)
- Apply protocols
- Evaluate claims
- Report on findings

**Technology Developers**
- Clients (>2000 companies)
- Performance claims

**Independent Testing Agents**
- Accredited laboratories
- Data to support client claims

**Markets for Environmentally-Sound Technologies & Services**

CANADA VERIFIED · VÉRIFIÉ

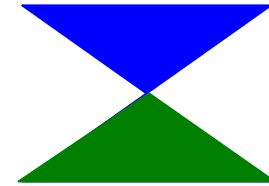**Development and promotion of new environmentally-sound technologies**

**Independently verified data to augment technology purchasing decisions**

# Technology Verification Examples

- **"Decontaksolv®"**
  Sanexen Environmental Services

- **"Continuous Thermal Desorption Technology"**
  Trans-Cycle Industries Inc

- **"Enhanced Auto Thermal Thermophilic Aerobic Digestion"**
  International Bio-Recovery Corporation

- ADI INTERNATIONAL INC.
    Drinking Water Arsenic
    Removal Units
- STORMCEPTOR CANADA INC.
    Stormwater Runoff
    Treatment System
- HYGENITEK INC.
    Mercury Amalgam
    Removal Unit

- **Quiet Cat<sup>TM</sup> Particulate Reactor<sup>TM</sup>**
  Environmental Solution Worldwide

- **Marvel<sup>®</sup> Liquid Manure Management System**
  Global Earth Products Inc.

- **Encelium Energy Control System**
  Encelium Technologies Inc.

**Scope:**

- Inter-jurisdictional reciprocity
- Mutual recognition and accreditation of Verification Entities
- Sharing of protocols and test methods
- Better information and knowledge management

# Harmonization and Cooperation

**Inter-jurisdictional reciprocity:**

- Federal-Provincial Agreements (Inter-Provincial Working Group) to streamline permitting and approvals

- International Agreements to facilitate technology cooperation and capacity building - ETV Canada has already worked with China, India and South Korea and seeking to cooperate with others

**Mutual recognition and accreditation of Verification Entities (VEs):**

✔ Further development and nurturing of an effective network of credible VEs

✔ ETV Canada is exploring options with its own distributed network of VEs

✔ Some VEs already accredited under other programs

# Harmonization and Cooperation

**Sharing of protocols and test methods:**

- Cooperation to further develop and apply effective protocols and test methods
- Promotion of standardized methodologies for demonstration, testing and evaluation of performance claims
- Good starting point for international cooperation

**Information and knowledge management:**

- Co-operation among verification organizations to improve quality of environmental performance reporting

- Basic requirement for effective technology cooperation

- Important focus for improving access to information and encouraging the adoption and use of environmentally-sound technologies

**Moving Forward – Vision:**

Accelerate the implementation and deployment of ESTs through credible environmental performance verification

**Opportunities for Synergy:**

- Development of relevant performance benchmarks and verification protocols
- Performance verification of technologies of national and international importance
- Establishment of mechanisms for harmonizing performance verification and reporting

# Summary

- All components of ETV Canada's strategy are supportive of Agenda 21 and CEPA

- Certain aspects are directly linked to various Multi-lateral Environmental Agreements

- ETV Canada would like to strengthen its working relationships with all partners in areas of mutual interest to promote global access to Environmentally-Sound Technologies.
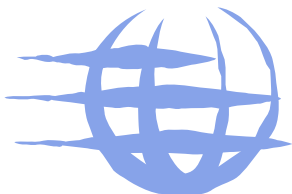
ETV Canada
2070 Hadwen Road
Mississauga, ON
Canada L5K 2C9
Tel: +1-905-822-4133
Fax: +1-905-822-3558

www.etvcanada.ca

etv canada