Recent Canadian Developments in Testing and Verifying Environmental Performance of Technologies

Joint Meeting of EU ETVS Projects

Stuttgart, June 2007

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Background - ETV Canada

- **Licensee** of the Government of Canada Environmental Technology Verification Program (established in 1997)
- Environment Canada and Industry Canada funded development of initial verification program intellectual property and assessment protocols
- Provides **independently verified data** to:
  - augment investment and purchasing decisions
  - facilitate permitting and approvals
  - help qualify and implement sector specific solutions
  - address pre-normative regulatory requirements
- Supports **development** and **promotion** of new environmentally sound technologies

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ETV Canada Role

- *Administers program on a cost recovery basis, as sole licensee of Canadian ETV trademark*
- *Manages a Canada wide network of verification entities to conduct 3rd party validation of performance test data*
- *Markets program through web site, trade shows and fact sheets*
- *Assists Environment Canada harmonization initiatives with provinces and other countries*
- *Undertakes international technology cooperation and training activities on a fee for service basis*
- *Supports Inter-provincial Working Group (IPWG) activities to facilitate provincial permitting and approvals*
- *Identifies candidates for the awarding of ETV Certificates by the Minister of Environment (55 Graduates since 1997)*
- *Monitors client compliance with trademark use policy*

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Environment Canada Role

- *Owns Canadian ETV Program General Verification Protocol (GVP) and ETV trademark Intellectual Property*
- *Oversees delivery of domestic program by ETV Canada (a division of OCETA, a not-for-profit organization)*
- *Supports development and implementation of test protocols through federal technical institutions*
- *Co-Chairs Inter-provincial Working Group (IPWG) to guide harmonization with Provinces*
- *Represents Canada on initiatives with other countries interested in verification (e.g. Japan, Korea, China, India)*
- *Provides Secretariat for International Committee on EPV Harmonization with US EPA the European Commission*
- *Coordinates awarding of ETV Certificates by Minister at key events (i.e.,Globe Conference and Trade Show)*

Need for EPV

- Decision-makers need assistance in identifying priority issues and realistic expectations for performance
- Reliable information creates a level playing field for solution providers and users
- Verification against well-defined performance objectives leads to informed decision-making

Scope for Performance Verification

- Solutions implementation includes technologies and processes, as well as management practices
- Includes technologies, as well as projects, programs and baselines for reporting
- Includes solution providers, adopters and other stakeholders – requires their engagement
- Covers a broad range of production and consumption technologies (not just “environmental” technologies)

Technology Verification

Involves:

- Qualified testing organizations
  - Test methods relevant to the specific features and performance characteristics of the technology being verified
- Distributed Network of Verification Entities (VEs)
  - Third-party independent verification of performance to reduce subjectivity and conflict of interest
  - Selection based on technology expertise and independence

Performance Benchmarking

Development of environmental and sustainability performance criteria through stakeholder engagement to support sector and program priorities and initiatives.

Involves:

- Regulatory agencies
- Sector associations
- Technology users and providers

Uses a facilitated stakeholder process to identify acceptable performance criteria

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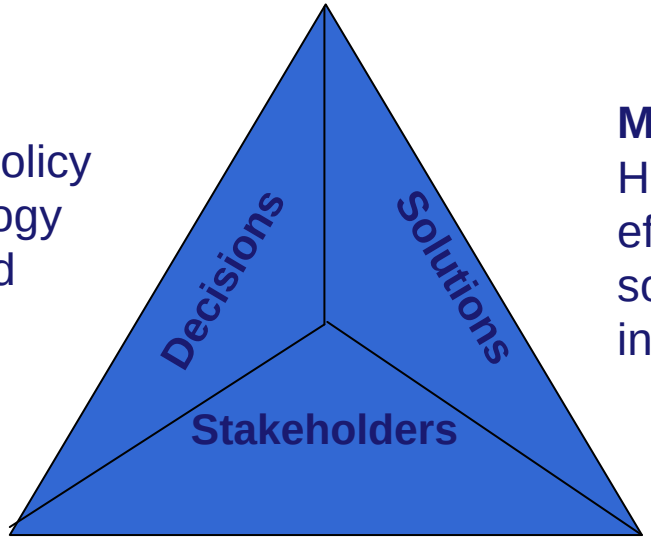
Benefits

Independent Verification of Performance Claims

Decision Support - Assists regulators, policy makers and technology users make informed decisions



Market Acceptance – Helps innovators bring effective environmental solutions to domestic and international markets

Stakeholder Engagement – Provides mechanism for performance benchmarking so that test plans and verification protocols reflect, economic, social and environmental criteria

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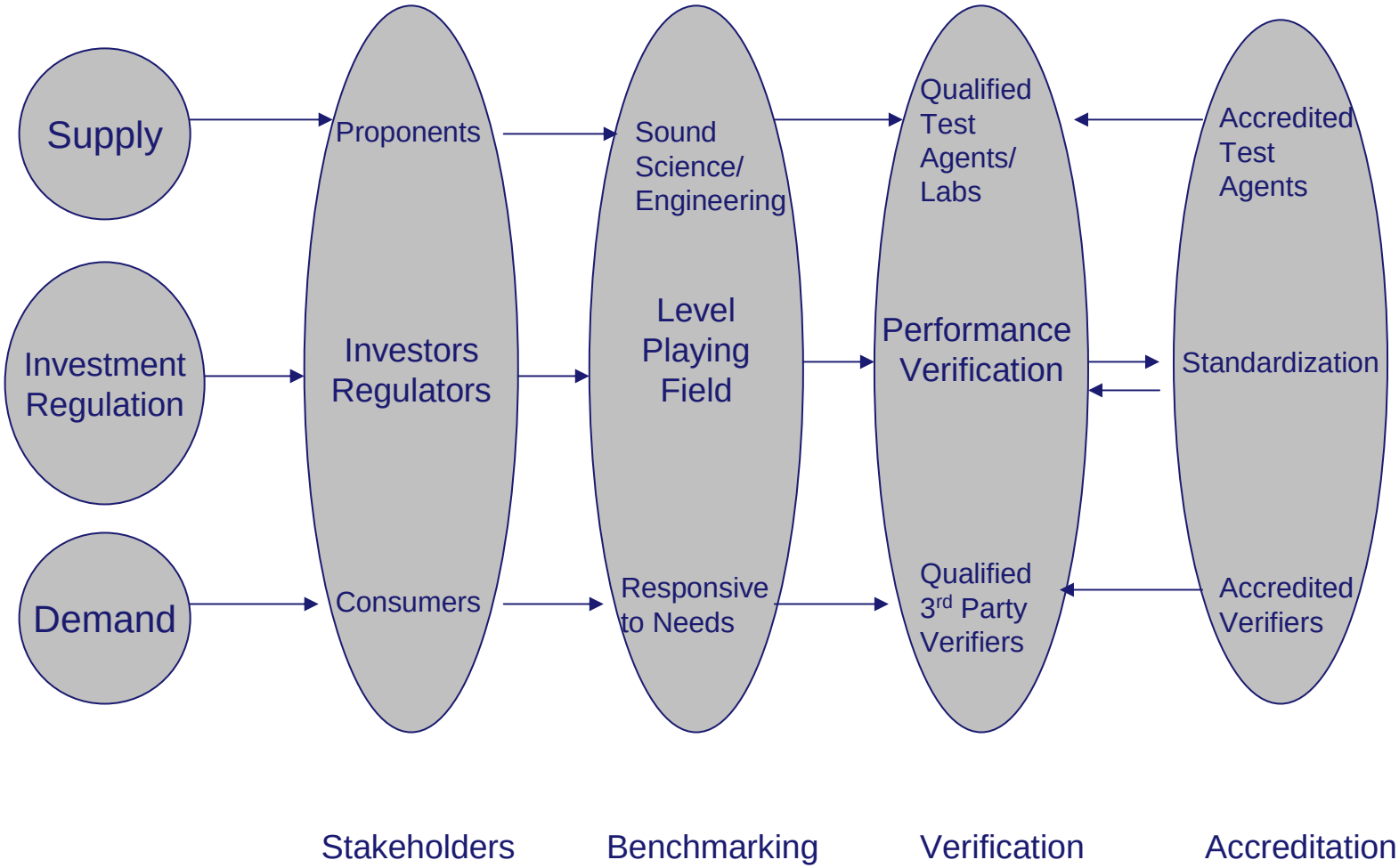
Areas of Influence



Relevant at Multiple Levels

1. **Early in the decision-making process**, to identify achievable targets upon which verifiable performance criteria can be based
2. **As a screening and assessment tool** for technology selection, based on acceptable performance criteria and recognized protocols
3. **During implementation**, to determine actual technology performance through comprehensive testing and verification using relevant technical protocols and sound statistical analysis

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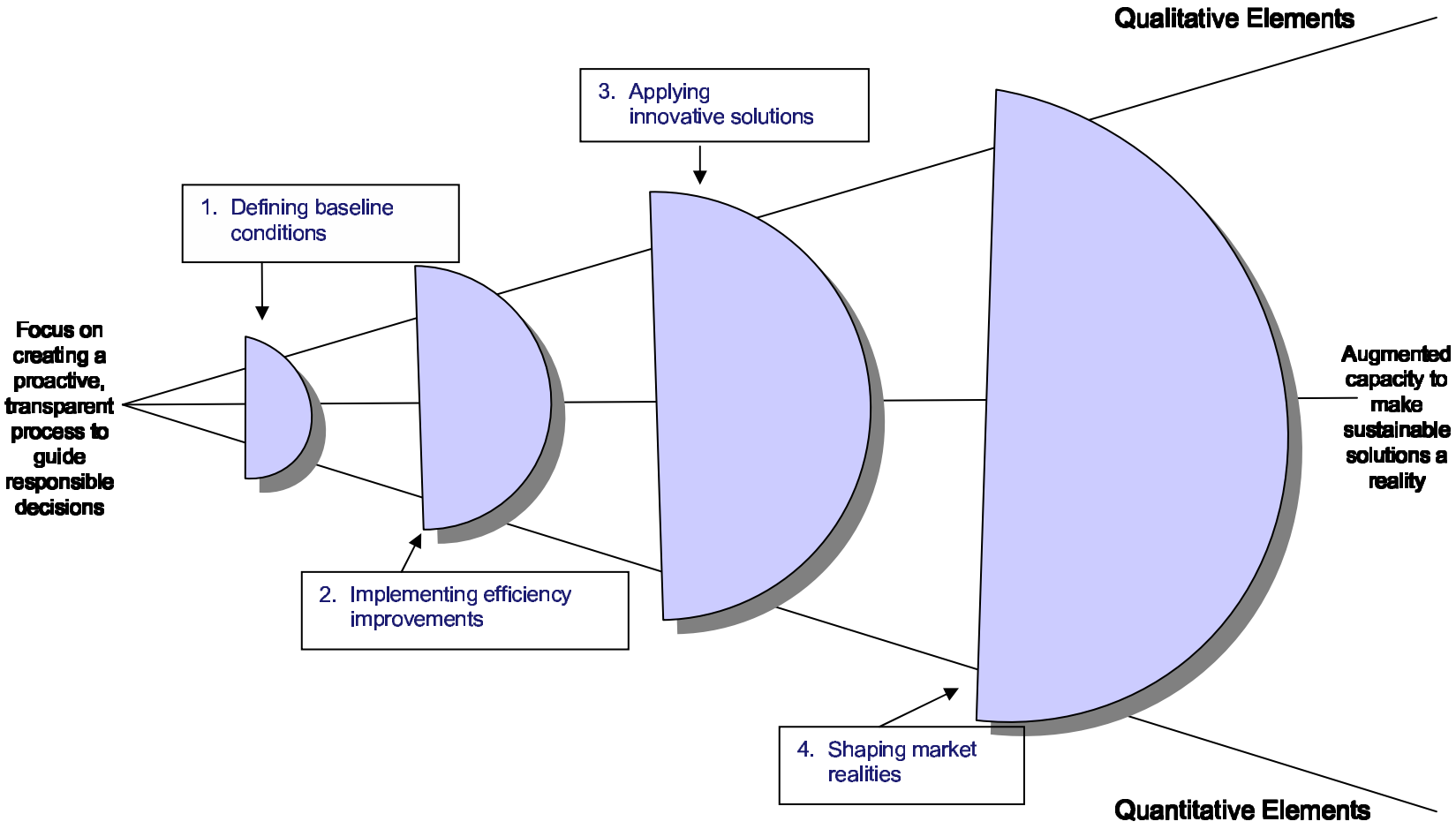
Clients

- Managers (solution adopters) within corporations and government agencies
  - Advice on innovative solutions in order to make informed procurement decisions
- Financial institutions, funding agencies and regulatory authorities
  - Better information for characterizing and quantifying risk in order to mobilize financial resources and responsible investment
- Solution providers
  - Credible data to profile performance claims
  - Level playing field

Continuous Improvement

- Mobilizes stakeholder involvement/commitment
  - Integrates capacity-building, knowledge management and continuous learning
- Streamlines permitting and approvals processes
  - Costs of performance testing and verification can be built into technology development and demonstration plans
- Enables development and deployment of environmentally sound solutions

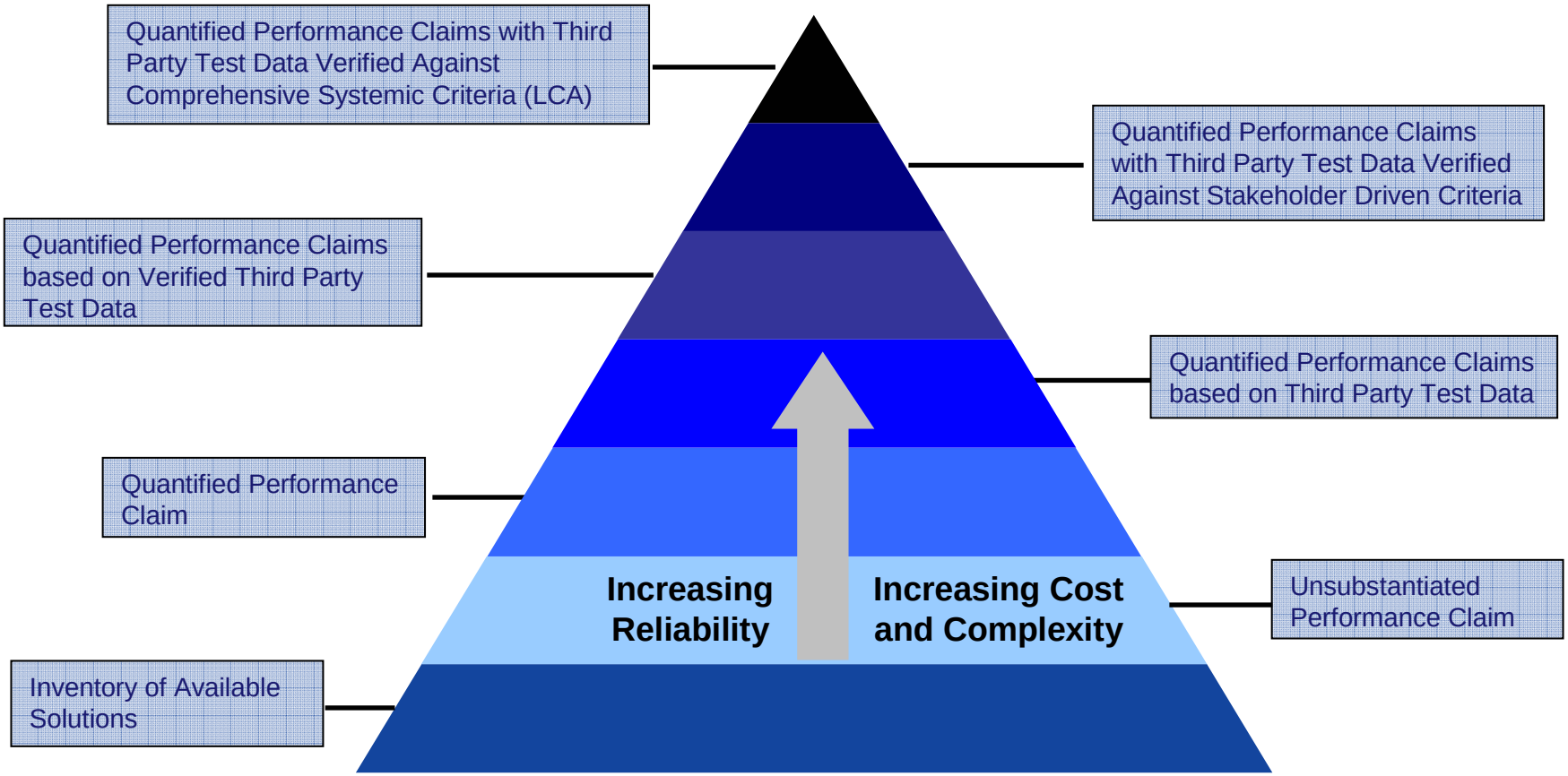
Tool to Guide Proactive Actions



Challenges

- Different views on scope and rigour of verification (and qualifications of testing and verification organizations involved)
- Need to balance both “supply-side” and “demand-side” expectations which may be different based on the nature (and origin) of the claim:
  - Proponent-based claim
  - Stakeholder-based claim (derived from criteria developed by a representative stakeholder process)
  - Claim derived from criteria linked to demonstration and/or implementation

Range of Claims



Range of Verification Clients

Proponents:

1 - With complete data sets

2 – With data sets needing clarification/augmentation

3 – Needing to modify their performance claims

4 – Requiring technology/market assessment

5 – Requiring new protocol development

Quality Management

- Quality management, conformity assessment and accreditation
  - Beyond General Verification Protocol (GVP)
  - Compatibility with quality management systems and practices in other countries
  - Use of existing ISO standards for accreditation of test agents, analytical laboratories, and verification entities
- Need effective international harmonization

Meeting the Challenges

- Cross-Marketing
  - Implementing proactive approaches to engage stakeholders in key sectors
  - Promoting awareness and building capacity
  - Building linkages with other performance assessment and reporting initiatives
  - Integrating performance verification with other societal objectives
- Distributed Delivery Networks and Partners
  - Promoting performance verification through available networks
  - Strengthening capacities and building alliances
  - Learning by doing

Meeting the Challenges

- Quality Management
  - Establishment of a Quality Management System consistent with ISO through the Standards Council of Canada (SCC)
  - Application of existing ISO standards for accreditation of test agents, analytical laboratories and verification entities (SCC)
  - International harmonization conformity assessment and accreditation processes (with EU and EPA)
- Government Cooperation and International Harmonization
  - Linking to Government priorities and verification needs
  - Strengthening institutional mechanisms
  - Cooperation and collaboration on protocols
  - International Committee for Harmonization

Canadian Network of Environment and Technology Institutes (CNETI)

Primary Domain Areas		Secondary Domain Areas	
Canadian EPV System Management Coordination	Lead: EC S&T	Accreditation System	SCC CAB
		Quality Management	ETV Canada
		Generic Protocols	
		Stakeholder Process	
		Program Delivery to Technology Proponents	
Clean Air	Lead: EC ESTC	Stationary	NRCan CANMET
		Mobile	EC ESTC
Climate Change	Lead: NRCan	Mitigation	NRCan CANMET
		Adaptation	NRCan Earth Sciences
Site Remediation	Lead: EC ESTC	Ex-situ	EC ESTC (SAIC)
		In-situ	NRC BRI
Clean Water	Lead: EC NWRI	Drinking	EC NWRI
		Wastewater	
		Stormwater	
Integrated Cross Cutting	Lead: NRC ICPET	Sustainability Assessment	NRC ICPET
		Monitors & Sensors	
		Green Buildings	NRC IRC

Harmonization and Cooperation

- Inter-jurisdictional reciprocity
  - Inter-jurisdictional agreements to streamline permitting and approvals to facilitate technology cooperation, capacity building and standard approaches to performance measurement, verification and reporting
- Mutual recognition and accreditation of Verification Entities
  - Ongoing development and nurturing of international network of VEs
  - Accreditation of VEs in multiple jurisdictions using internationally accepted procedures

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
- Better information reporting and knowledge management
  - Co-operation among verification organizations to improve quality of environmental performance reporting
  - Important focus for improving access to performance information and encouraging the adoption and use of environmentally sound technologies

International Harmonization

International Committee for Environmental Performance Verification - Key Objectives:

- **To harmonize protocols for the reporting and verification of environmental performance information;**
- **To develop internationally recognized environmental performance test methods through sharing of procedures and co-verifications;**
- **To establish an international network of accredited verification organizations and/or professionals;**
- **To explore the establishment of an ISO standard for environmental performance measurement, verification and reporting.**

International Activities

- **North America -** United States EPA and Environment Canada – Expanding cooperation in key strategic areas (e.g., air pollution, GHGs, advanced monitoring, water quality protection, etc.)
- **European Union** - Environmental Technology Action Plan - Pilot ETV initiatives on clean air, land remediation, water
- **Asia -** Regulatory agencies and industry associations in Japan, India, China, Korea, Bangladesh and other jurisdictions are developing or expanding environmental performance verification programs
- **UNEP** – Bali Strategic Plan for Technology Cooperation and Capacity Building

Case Studies

Example 1 – Arsenic in Bangladesh

Example – Arsenic in Bangladesh

Issue

- 40 million people in Bangladesh are consuming arsenic-contaminated groundwater
- 150,000 Bangladeshis have already been diagnosed with symptoms of arsenic poisoning
- Reluctance to deploy treatment technologies to address the problem, due to potential liabilities

Solution

- Internationally recognized performance criteria and a rigorous process for screening, assessment and verification of viable arsenic removal technologies

Example 2 - Manure Management

Example -Manure Management

Issue

- Manure produced by agricultural livestock operations has potential for significant environmental impacts
- Operations often utilize large farm acreage for spreading manure or produce manure by-products
- These practices raise technical, societal and regulatory issues that need to be addressed to ensure that livestock operations meet environmental requirements while remaining competitive

Solution

- Performance benchmarking and verification to help operators and regulatory authorities understand the real performance of manure treatment technologies and management practices.

Example 3 - Vehicle Fleets

Example – Vehicle Fleets

Issue

- Municipalities and other organizations operate fleets of automobiles, trucks and motorized equipment and consume large volumes of fuel
- Fleet managers have goals to reduce engine exhaust emissions, greenhouse gas emissions and fuel consumption
- Need to understanding the true value of “after market” technologies and products (e.g., fuel additives, fuel line devices, Catalysts, hydrogen generating units, anti-idling devices, etc)

Solution

- Verified performance information based on relevant performance criteria and testing protocols using approved drive cycles to guide acquisition and use of after–market devices

Outcomes for All Case Studies

- Stakeholder Involvement and Commitment
  - Credible performance guidelines, screening methods and verification protocols
  - Standard testing/evaluation templates
  - Technical capacity to assess and verify performance results
- Independently Verified Data
  - Augmented investment and purchasing decisions, minimizing risk and facilitating project financing
  - Streamlined permitting and approvals (due diligence and regulatory acceptance)
- Policy Guidance
  - Sector specific environmental performance standards
  - Mechanism to facilitate inter-jurisdictional cooperation
  - Market acceptance of environmentally sound solutions

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