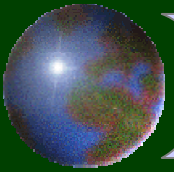


# Reducing Sustainable Environmental Technology Risk

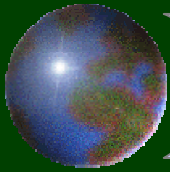
Dr. Troy D. Vassos, P.Eng.

NovaTec Consultants Inc.



# Outline

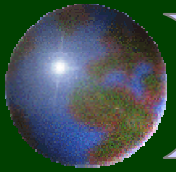
- **Sustainable Environmental Technology (SET)**
- **Risk Reduction Methods**
  - **Technology Verification**
  - **Establish Standards**
  - **Research & Testing Collaboration**



PRI – Technology Panel Discussion

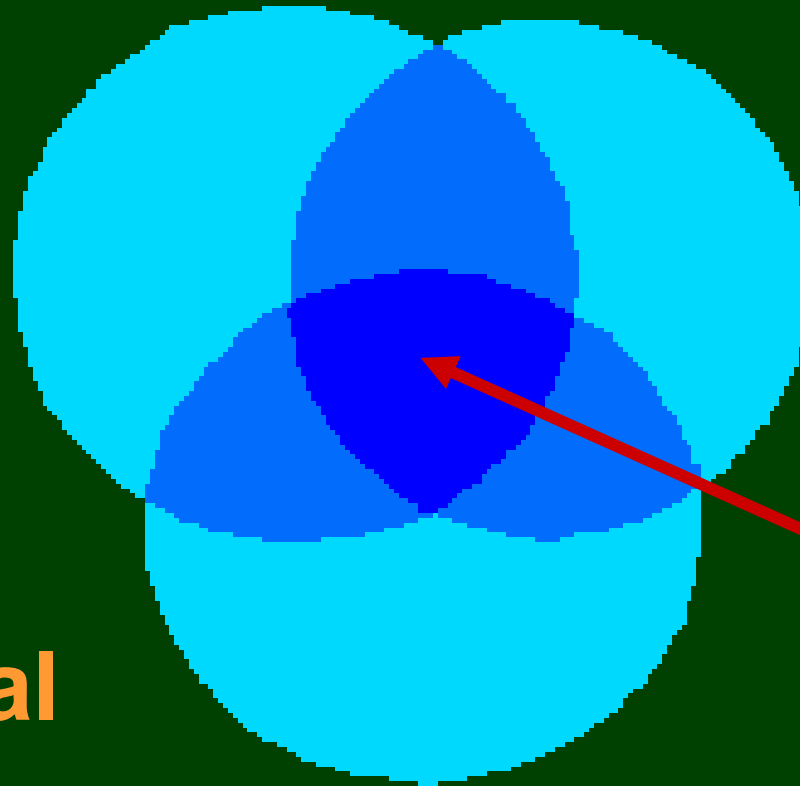


# Wastewater Treatment Sustainability Perspective



**Economics**

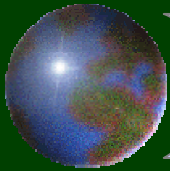
**Social**



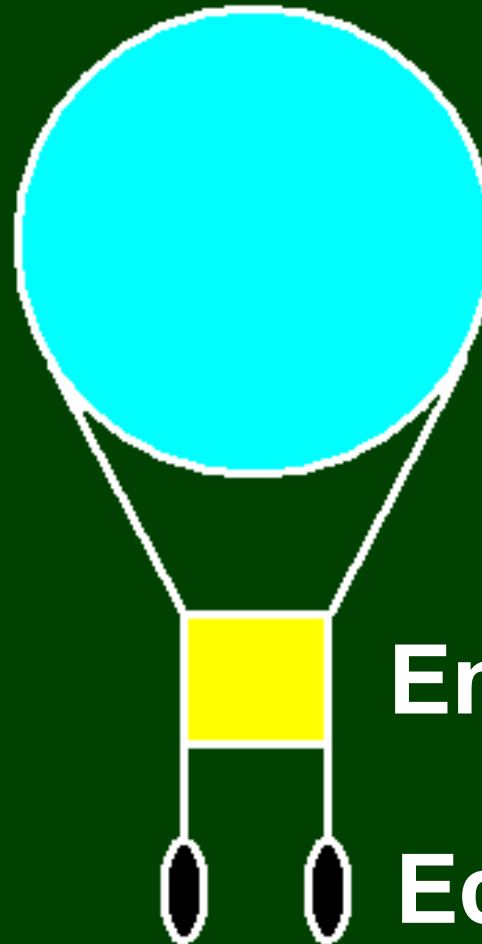
**Optimal  
Spot**

**Conventional  
Model**

**Environment**



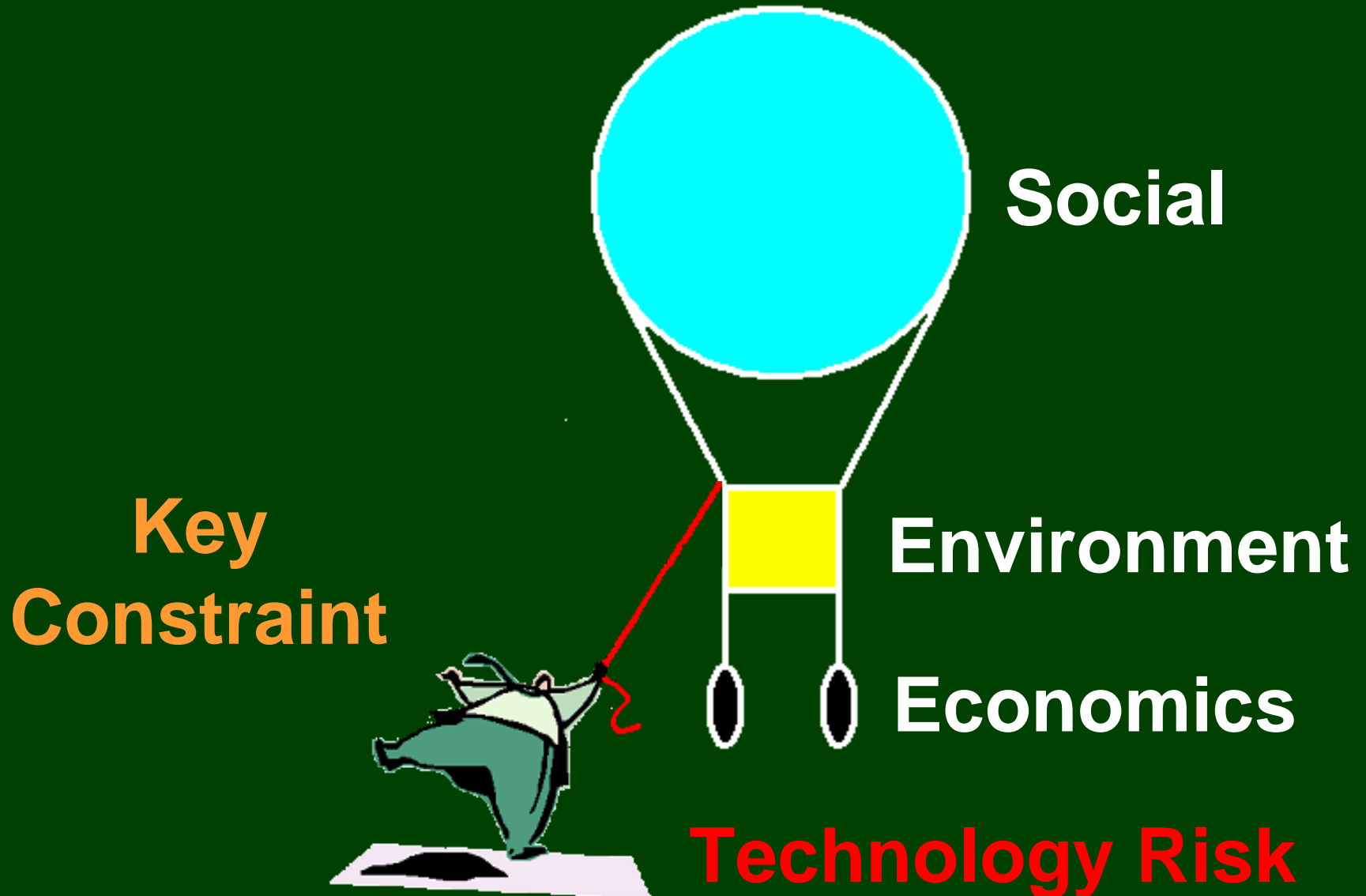
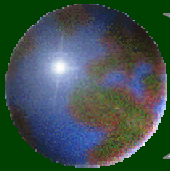
**Alternative  
Model**

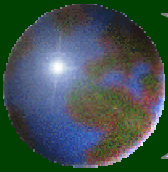


**Social**

**Environment**

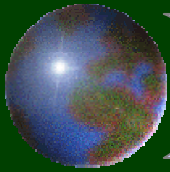
**Economics**





# Technical Risk

- Innovative technologies have technical risk. ■
- **Technical Risk = Financial Risk**
- Government is typically risk averse.
- How can we reduce risk without becoming innovation averse?

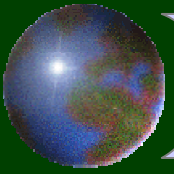


PRI – Technology Panel Discussion

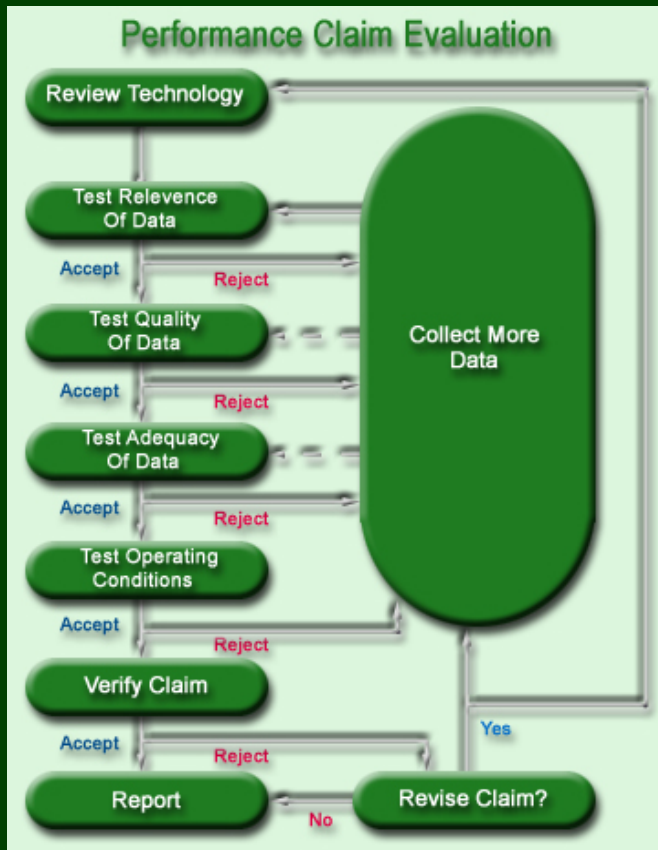


# Wastewater Technology Verification & Certification

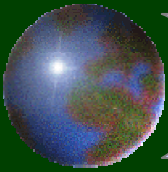




# Technology Verification



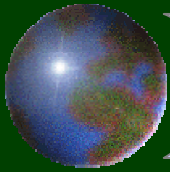
- Independent third party assessment of performance claims
- **Audit** - review technology & data supporting claims
- **Testing** – test equipment & collect data



# North American Technology Verification & Certification Programs



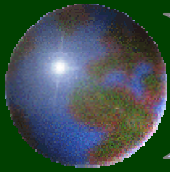
- NSF International (ANSI Standards)
- US EPA (ETV)
- ETV Canada Inc.
- Instrumentation Testing Association



## NSF/ANSI Standards



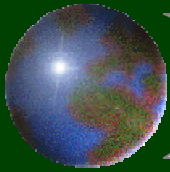
- Specifies Technology
- Design Loadings
- Sampling & Testing
- Duration
- Stress Testing
- Subcontrator Testing



# US EPA ETV Testing Protocols



- Specific Technology
- Design Loadings
- Sampling & Testing
- Duration
- Testing Done by 3<sup>rd</sup> Parties



## ETV Canada Inc.



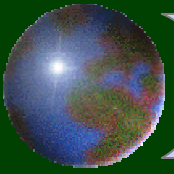
Environment  
Canada

Environnement  
Canada

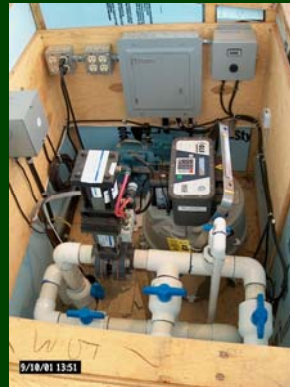


Ontario Centre for Environmental  
Technology Advancement

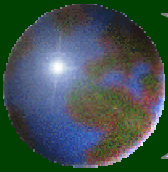
- Voluntary Program
- Performance Claim Verification Program
- License Agreement with Environment Canada
- Managed by OCETA



# Wastewater Testing at Municipal Facilities



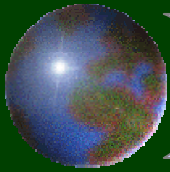
- GVRD Treatment Facilities (Technology Development)
- Squamish Test Facility (3<sup>rd</sup> Party Testing)



# Instrumentation Testing Assoc.



- Municipal Members
- Pool Financial Resources for Testing
- Manufacturer Input
- Published Reports for Members

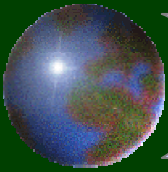


PRI – Technology Panel Discussion



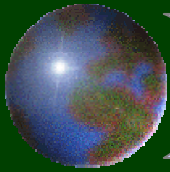
# Establish Standards





# Canadian Water Reuse Standard

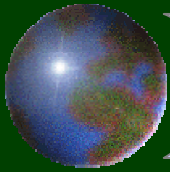
- Canadian National Standard Process
  -
- Health Canada Initiative with CMHC
- Standard Recommendations
- Multi-stakeholder Committee
- Integrate with National Building Code



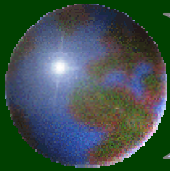
# P<sup>3</sup> Research Collaboration

## Centre for Environmentally Sustainable Technologies

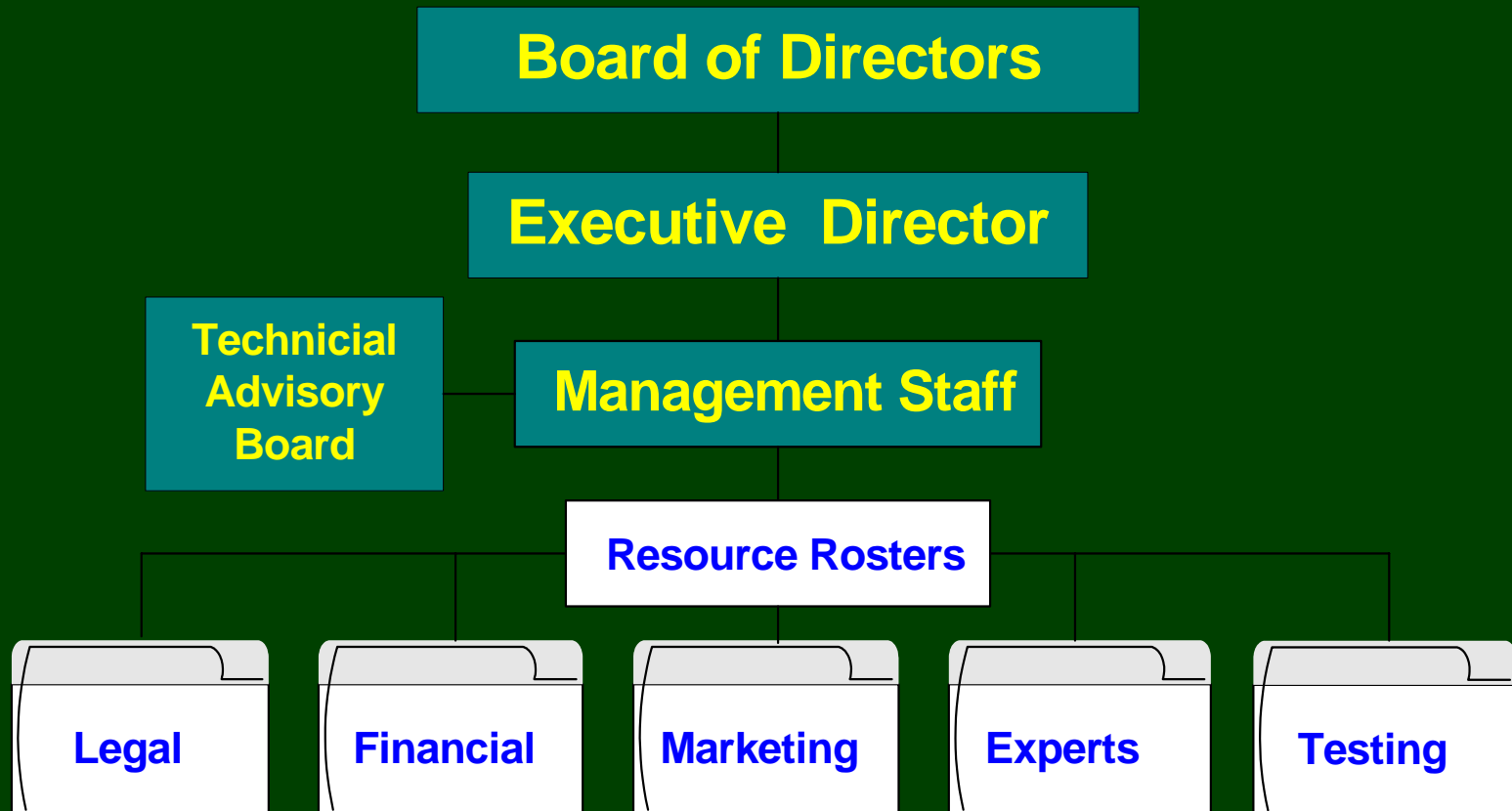
(C - EST)

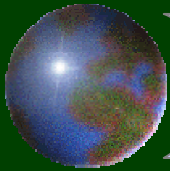


- **Virtual Centre** - manages regional, national and international inventories of experts, resources, and facilities required for EST development. ■
- **Reduce Technical and Financial Risk** - technology verification, demonstration & commercialization.
- **Advocate for EST Solutions** - advising on technology, legislation and education – develop standards.



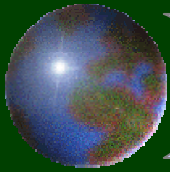
# PC-EST Structure



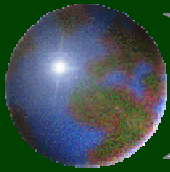


# Technology Areas

- **Water Resources**
    - Wastewater & Reuse
    - Potable Water
    - Stormwater
    - Groundwater
  - **Expanding to Cover**
    - Air
    - Land
    - Energy
- ✓ Investment & Due Diligence
  - ✓ Verification
  - ✓ Demonstration
  - ✓ Pollution Prevention
  - ✓ Treatment
  - ✓ Conservation & Efficiency
  - ✓ Reuse, Recycling
  - ✓ Policy Development
  - ✓ Regulatory Review
  - ✓ Demand-side Management
  - ✓ Education



# EXAMPLE OF WHAT WE DON'T WANT TO DO ....



# BC Environment Risk Management

- Municipal Sewage Regulation
- Capital Replacement Fund  
(100% of cost with inflation)
- O&M Security  
=  $\$1400 \times Q$  (m<sup>3</sup>/d)

