Developing Sustainable Development Indicators for the Electric Utility Industry

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Overview

- Background
- Methodology
- Sustainable Development Indicator (SDI) Design Process
- Examples
- Summary and Conclusions

Background

- Introduction
  - a pressing need to determine how electricity needs can be met in a more sustainable manner
  - driving forces:
    - legislation
    - stakeholder demands
    - continued technological innovation
    - increasing trend towards deregulation
    - business benefits
  - key actions:
    - WBCSD
    - GRI
    - industry associations
    - individual companies

Background

- Introduction
  - underlying challenge: to meet the needs of the present without compromising the ability of future generations to meet their own needs
    - integration of SD practice into existing operations
    - identify future options that meet stakeholder and utility needs
  - the hardest part about SD is actually achieving it
    - must be translated into practical dimensions
  - biggest gap: ongoing requirements to find methods of measuring progress with respect to environmental, economic, and social impacts
  - fundamental to these tasks is the creation and implementation of SD indicators

Background

- Sustainable Development Indicators (SDI)
  - signs, symptoms, trends, or warnings that identify relationships based on defined parameters
  - must provide us with the ability to recognize the presence or absence of SD, or threats to SD in the systems under our stewardship
  - must help us understand the linkages, connections, and interdependencies between our environment, economy, and society
  - while indicators cannot tell us everything, they should tell us enough to make good decisions possible

Background

- SDI in Electric Utility Industry
  - energy issues are a prominent component of indicator efforts at international, national, and local levels
  - few established efforts to develop SDI for utilities
    - previously noted programs
  - in existing programs, three key shortcomings:
    - it is often unclear how the indicators were developed
    - most programs focus primarily on environmental issues
    - aside from producing a report, little guidance is provided on the actual implementation of the indicators

Research Objectives

1. To design a process for creating SDI in an electric utility context
2. To develop SDI for the transmission system of an electric utility
3. To develop an IMS model that incorporates a module on sustainable performance

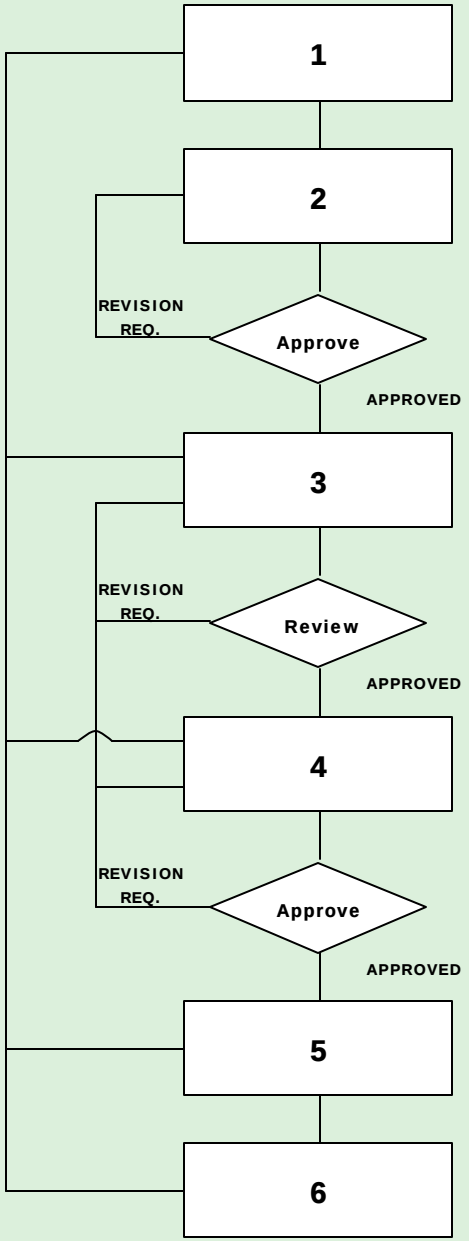
Phase 1 has been completed:

- extensive consultation with internal expertise at a case utility and relevant external expertise
- face validity test

The project is currently in Phase 2

SDI Design Process

1. Conduct needs assessment
2. Conduct process planning
3. Develop a draft set of SDI
4. Test and adjust the indicators
5. Implement the indicators
6. Review and improve



SDI Design Process

- Key Points:
  - key stakeholders must be involved throughout the entire process
    - employees, investors, customers, governments, suppliers, industry organizations, local communities, NGOs, the general public, other special interest groups
  - the manner in which the indicators are produced is just as important as the indicators themselves
    - standardized sets of indicators serve as useful reference points but the organization should go through the development of the indicators from the first principles
      - unique circumstances and organizational learning

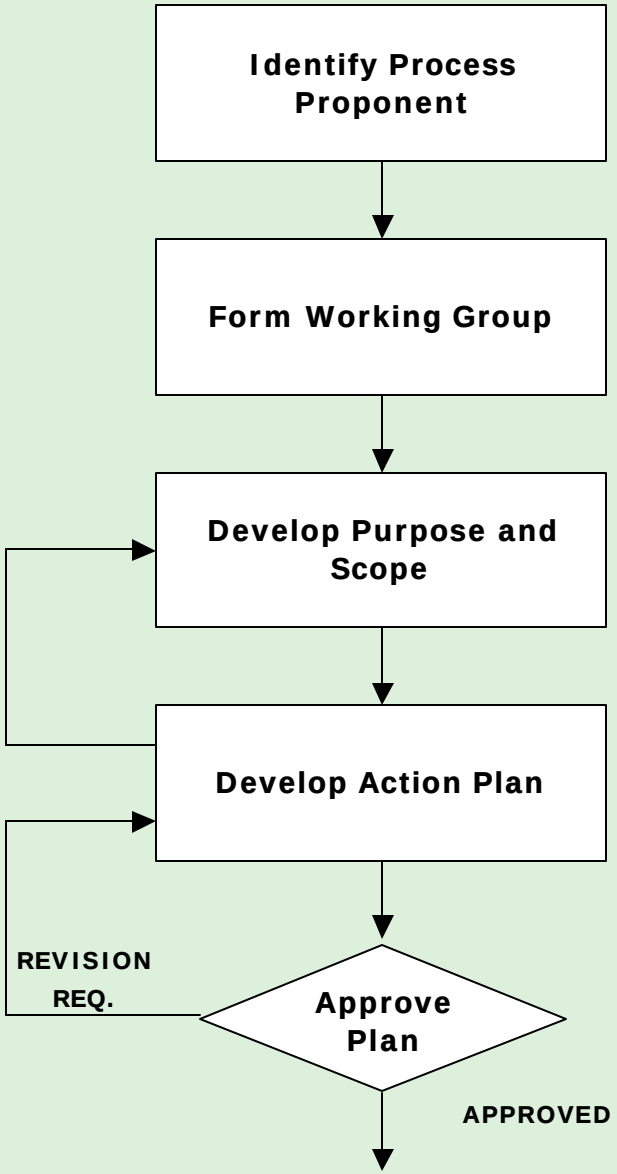
STEP 1
Conduct Needs Assessment

- Identify underlying needs that must be addressed by the process
  - forms the basis for the rest of the process
  - key questions:
    - who will use the indicators?
    - how will the indicators be used?
    - what types of indicators are currently available?
    - what are the major gaps in existing info systems?
    - what are some of the key anticipated challenges?

STEP 2

Conduct Process Planning

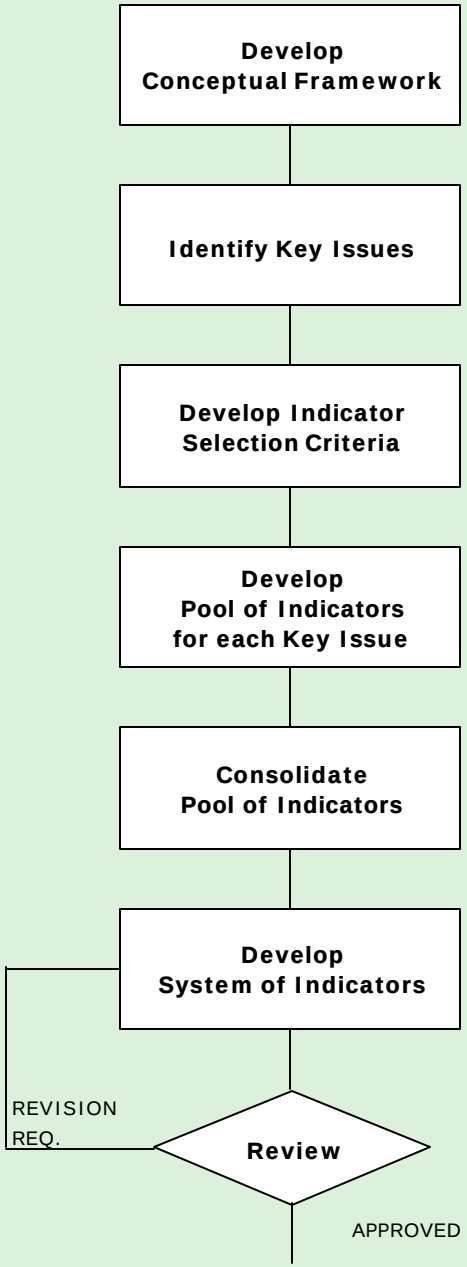
- Identify process proponent
- Form working group
- Develop purpose and scope
- Develop action plan
- Approve plan



STEP 3

Develop Draft Set of SDI

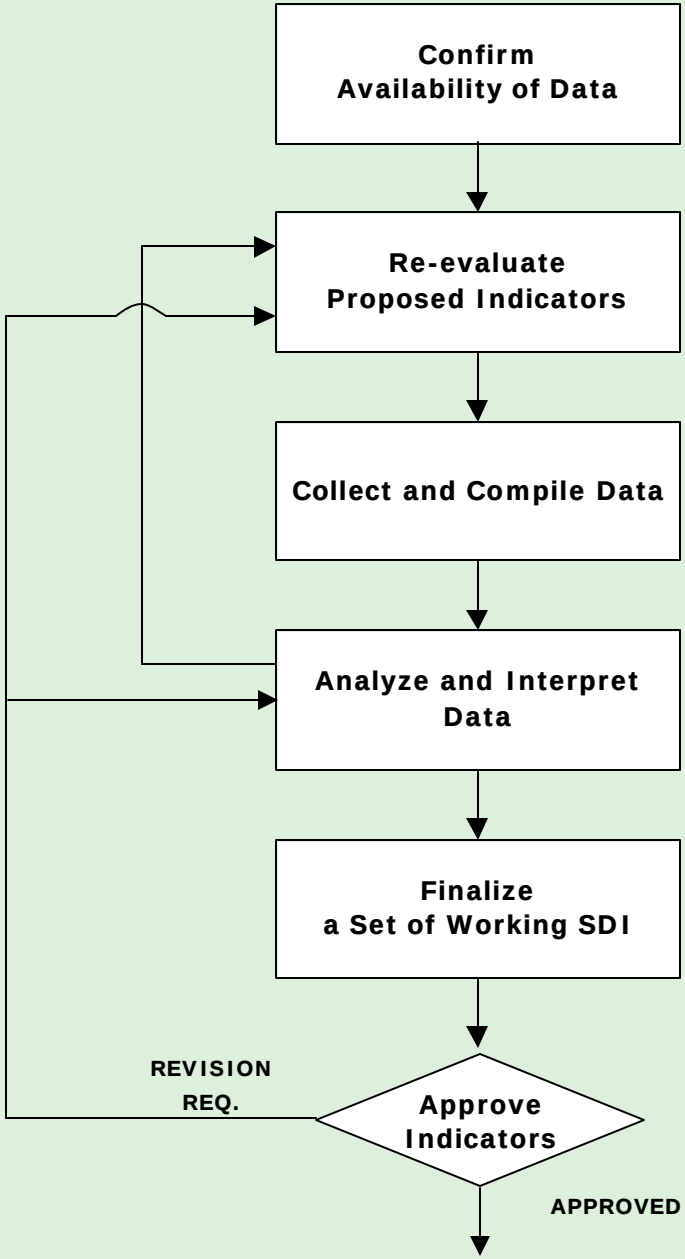
- Develop conceptual framework
- Identify key issues
- Develop indicator selection criteria
- Develop pool of indicators
- Consolidate pool of indicators
- Develop system of indicators
- Review indicators



STEP 4

Test and Adjust Indicators

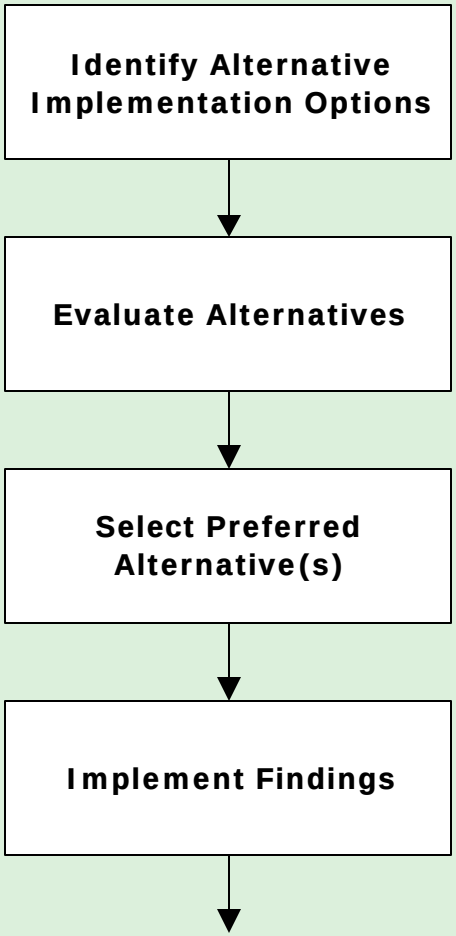
- Confirm availability of data
- Re-evaluate proposed indicators
- Collect and compile data
- Analyze and interpret data
- Finalize set of working SDI
- Approve indicators



STEP 5

Implement Indicators

- Key considerations:
  - communication with stakeholders
  - linkages to existing initiatives
  - timing of implementation
  - unique org. challenges
- IMS
  - integrated management system with a module on sustainable performance
  - systems approach



STEP 6
Review and Improve

- Ongoing monitoring and assessment is required
  - feedback loops
    - reflects iterative nature of the process
- A system of governance is needed
  - financial resources
  - human resources

TRANSMISSION SYSTEM

Example: Key Issues

Environment	Economy	Society
• Vegetation Management Practices	• Benefits to Customers and Stakeholders	• Employee and Public Safety
• Public Involvement	• Cost Issues	• Equity
• Potential Contamination	• Governance and Management Issues	• Community Relations
• Changes to Habitat	• Risk to Livestock	• EMF
• Loss of Forest Cover		• Private Property and Land Uses
• Increased Access		• Education and Training • Aesthetics

VEGETATION MANAGEMENT PRACTICES

Example: Pool of Indicators

- Kg Chemicals Used/Electricity Transmitted
- Percent of Right of Way (ROW) Treated with Chemicals
- Ratio of Soil Residual Herbicides vs. Non-Residual
- Hectares Contracted with Chemical Treatment vs. Hectares Contracted with Mechanical or Hand Clearing
- Cycle Time for Vegetation Management
- ROW Cleared vs. ROW Width
- Hectares of ROW Maintained/Total Hectares of ROW
- Cost per Year of Chemical Treatment vs. Cost per Year of Non-Chemical Treatment
- Hectares Treated Biologically
- Percentage of Total Research Dollars spent on Non-Chemical Vegetation Management Practices per Year
- Hectares/Treatment Practices
- Opportunities for Aboriginals
- Total Area ROW/Electricity Transmitted
- Total Area ROW/Design Capacity of Transmission System
- Minutes of Outages Caused by Trees
- Number of Complaints per Year
- Public Responses to Herbicides Announcements
- Hectares of Secondary Land Use

VEGETATION MANAGEMENT PRACTICES
Example: Consolidated Indicators

- Minutes of Outages Caused by Vegetation
- Hectares Managed per Total Land Base by Practice
- Cycle Time by Method of Vegetation Management
- Percentage of Total Research Dollars Spent on Non-Chemical Vegetation Management Practices per Year
- Public Responses to Herbicide Program Announcements

VEGETATION MANAGEMENT PRACTICES

Preliminary Example: System of Indicators

Required Information

1. Costs of Outages

- Minutes of outages caused by vegetation
- Cost of outage per minute
- Cost of outages caused by vegetation

2. Costs of Outage Prevention

- Hectares managed per total land base by practice
- Cycle time by method of vegetation management
- Life cycle cost per hectare managed by practice
- Cost of increasing frequency of vegetation mgmt. by practice

Indicator

- Cost of preventing outages by method vs. cost of outages

Summary and Conclusions

- Key Points:
  - there is increasing pressure on electric utilities to conduct their activities in a manner that balances economic, environmental, and social issues
  - many have made a commitment to apply the principles of SD to their operations
  - SD indicators can help measure progress towards SD goals
    - guide decisions towards more sustainable development
    - link sustainability issues with other initiatives
    - identify opportunities to improve
    - promote organizational learning
    - enhance transparency in external reporting

Summary and Conclusions

- Key Points:
  - SD indicators remain an emerging discipline and there is a need for sector-specific indicators as well as processes for their creation
- The SDI Design Process:
  - six-step process to create indicators at a utility
  - proactive, flexible, and transparent approach to developing and implementing indicators
- Ongoing Research:
  - process is part of an ongoing research program
  - currently developing indicators for the transmission system of a major Canadian utility