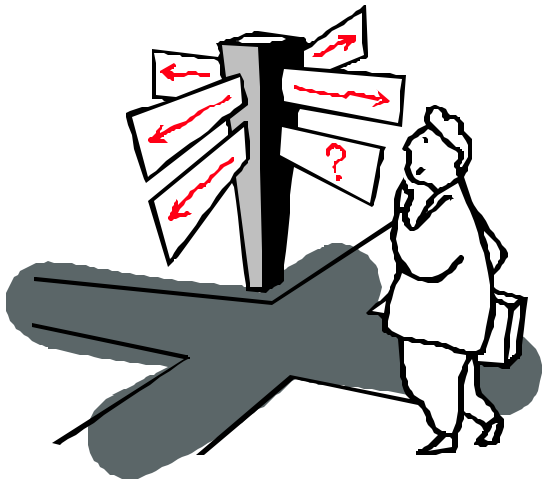
Developing Meaningful Metrics for an EMS



April 7-10, 2003

29th Environmental and Energy Symposium

Richmond, VA

TETRA TECH, INC.

Presenter Introduction

- Phil Wood, EMS Specialist
  - Private Sector Experience
  - Army, Air Force, Navy EMS
  - EPA Performance Track

Discussion Topics

- EMS Implementation metrics
- Performance metrics
- Available Guidance
- How to develop the “right” metrics

DOD Implementation Metrics

1. Gap Analysis
2. Signed Environmental policy statement
3. Ranking of environmental aspects
4. EMS Implementation plan
5. Management Review of system
6. Training of appropriate personnel

- Navy addition:
  - EMS Description Document
  - Documented Management Review of the System
- Army
  - Policy, Self-assessment, Implementation planning, Annual review

What is Measured Now?

- Statutory Information requirements
- Regulatory Information requirements
- Mission Critical Information

"What gets measured gets managed; and what gets managed gets done"

Aspect	First	Second	Third	Fourth
Drivers	Legal and external pressure	Efficiency	Strategic performance	Societal license to operate
Public Attitude	Trust me	Tell me	Show me	Involve me
Measures	Clean-up	Prevention	Chain management	Sustainable measurement
Functions	Registration, monitoring	Process changes, communication	Product design, Balanced scorecard	Integrated decision making
Expression	Emissions, costs	Efficiency	Eco-efficiency	Resources, societal costs, values
Scope	Substances, emissions	Processes	Products, processes	Sustainability issues
Reference Value	Regulatory targets	Other processes	Other products and suppliers	Societal values, Sustainability issues

Metrics

- What are you doing?
- How well are you doing it
- How do you know how well you are doing it?
- How can you demonstrate to others how well you are doing it?

- Strategic
- Effectiveness
- Operational
- Mission Focused
- Stakeholders considered

Global Reporting Initiative

- Environmental
  - Generally required
  - Organizational Specific
- Economic
- Social
- Partial Reports

Global Reporting Initiative

6.1 Total energy use

6.2 Amount of electricity purchased, by primary fuel source, where known.

6.6 Total materials use (other than fuel and water).

6.12 Total water use.

6.14 Greenhouse gas emissions in tons of CO2 equivalent 6.15 Ozone-depleting substance emissions in tons of CFC-11 equivalent (ozone depleting potential).

6.16 Total waste (for disposal).

6.25 Performance of suppliers relative to environmental components

6.28 Major environmental issues and impacts associated with the use of principal products and services, including disposal, where applicable.

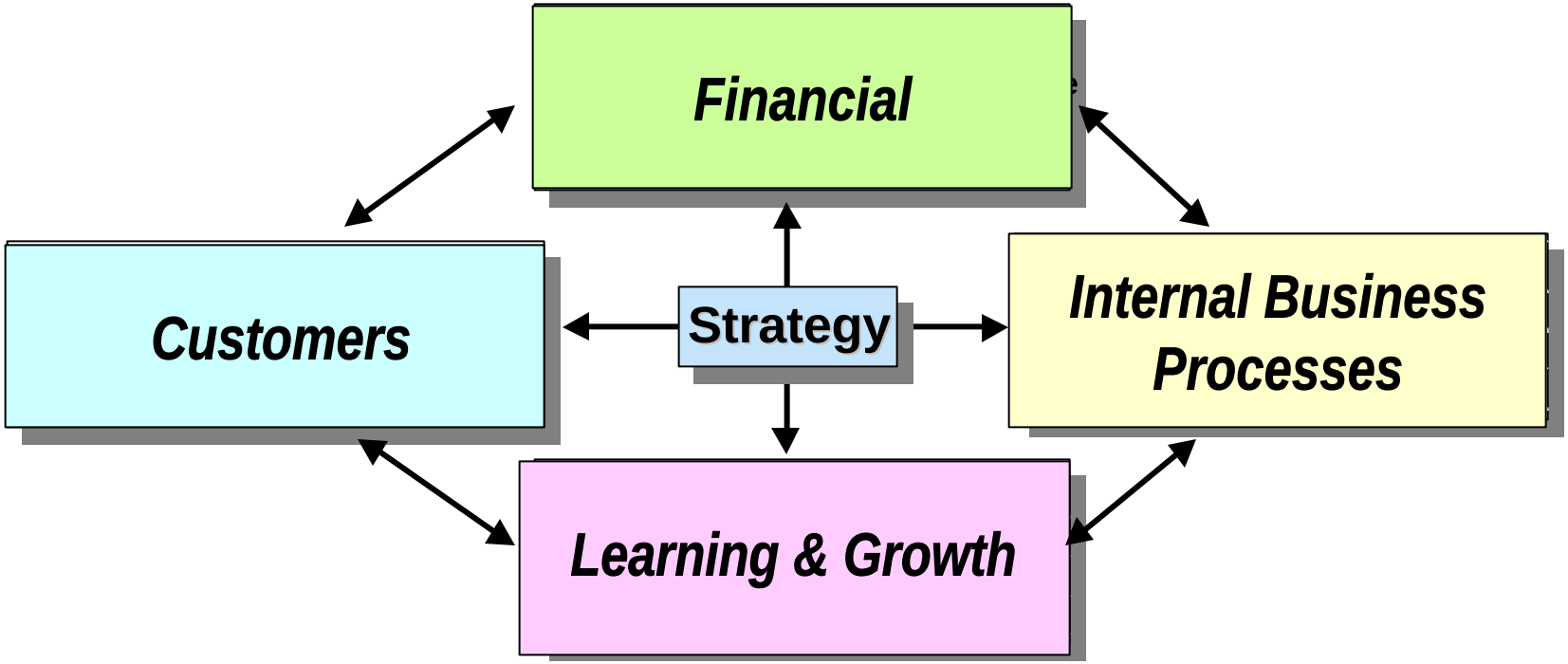
EPA's Performance Track Demonstrate Performance

- Use GRI framework
  - Category
    - Energy use
    - Materials use
    - Water discharge
    - Accidental releases
    - Restore resources

    - Water use
    - Air emissions
    - Waste generation
    - Preserve Resources

  - Environmental Aspects
    - Past performance select two
    - Future performance select four
- Three years participation
- Annual Performance report
- "Consistent with its own situation, capabilities, and goals"

Are the Metrics Balanced?



Source: Kaplan and Norton

ISO 14000 Family of Standards

- ISO 14001
- ISO 140031: Environmental Management — Environmental Performance Evaluation — Guidelines
  - Environmental Condition Indicators (ECI)
  - Environmental Performance Indicators:
    - Management Performance Indicator (MPI)
    - Operational Performance Indicator (OPI)
- ISO/TR 14032: Environmental Management — Examples of Environmental Performance Evaluation

Selecting Environmental Performance Indicators

Direct	—	tons emitted
Relative	—	gallons of waste water per person
Indexed	—	emissions in current year vs. baseline year
Aggregated	—	sum of discharges for base vs.per unit facility
Weighted	—	data modified by a factor related to significance

Indicator Clusters

- Two – human and environmental well-being
- Three – environmental, societal, and economic well-being
- Four – material wealth and economic development, equity and social aspects, environment and nature, democracy and human rights

Design

Consider:

- Policy relevance
- Simplicity
- Validity
- Time-series data
- Availability/Accessibility of data
- Ability to Aggregate
- Sensitivity
- Reliability
- Visual

Ensure:

- Objective and unbiased
- Statistically reliable
- Unobtrusive
- Inexpensive to collect
- Balanced
- Appropriate
- Quantifiable
- Comprehensive

Visual

- Standards of Excellence
- CGSDI Models
  - Four-sided pyramid
  - Elliptical indicator cluster
  - Compass of sustainability
  - Dashboard of Sustainability

Environmental Standards of Excellence

Installation / Program	Drinking Water	Pollution Prevention	Environ. Management	Training & Awareness	Wastewater	Hazardous Waste	UST's	Solid Waste
NAS SIGONELLA								
NSA NAPLES								
NSA GAETA								
NSA LA MADDALENA								
NS ROTA								
NSA SOUDA BAY								
JMF ST MAWGAN					N/A		N/A	
NAVACTUK					N/A			

1 April 99 STATUS		Red (Major Deficiencies)
		Yellow (Minor Deficiencies)
EMS Metrics		Green (Compliance)

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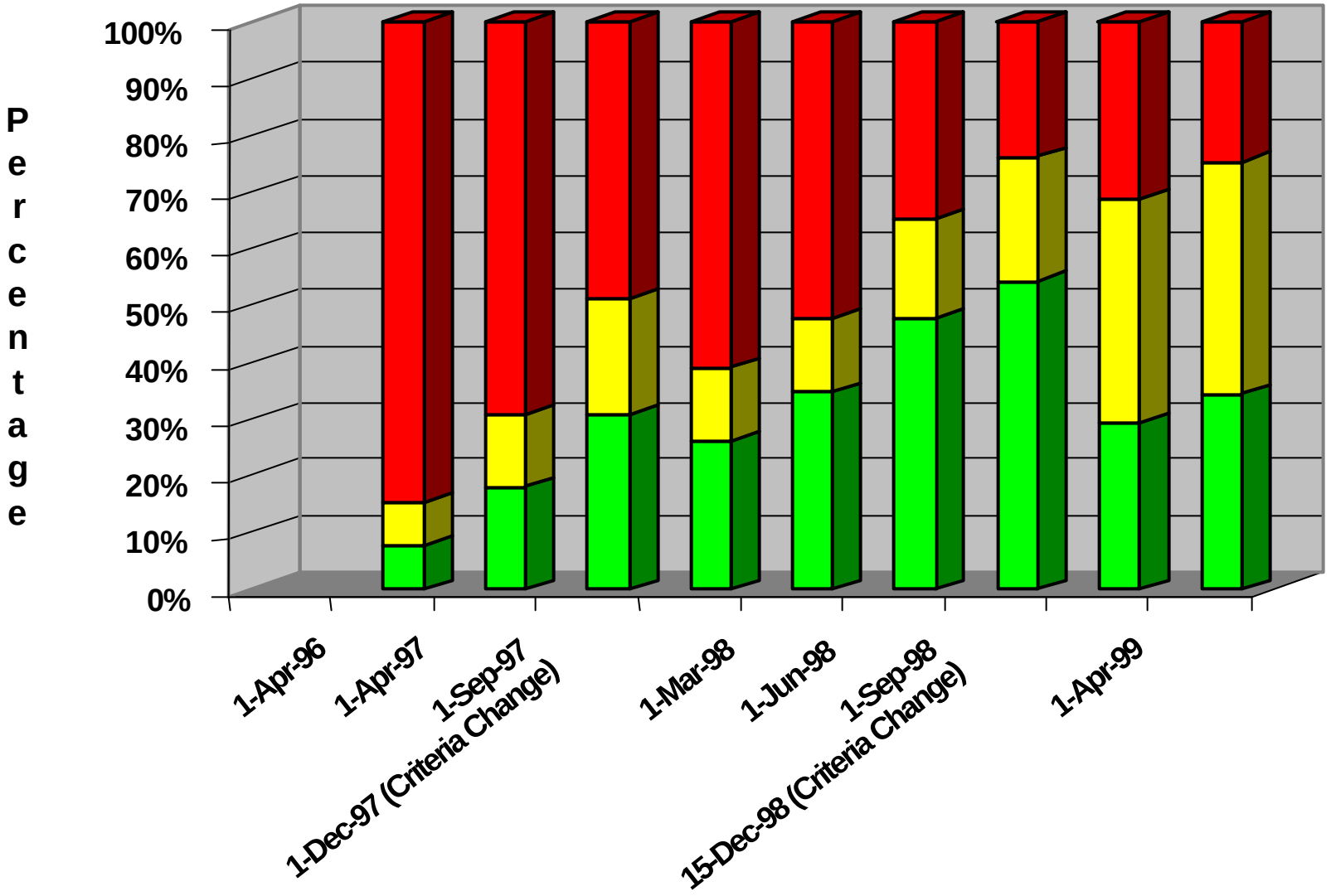
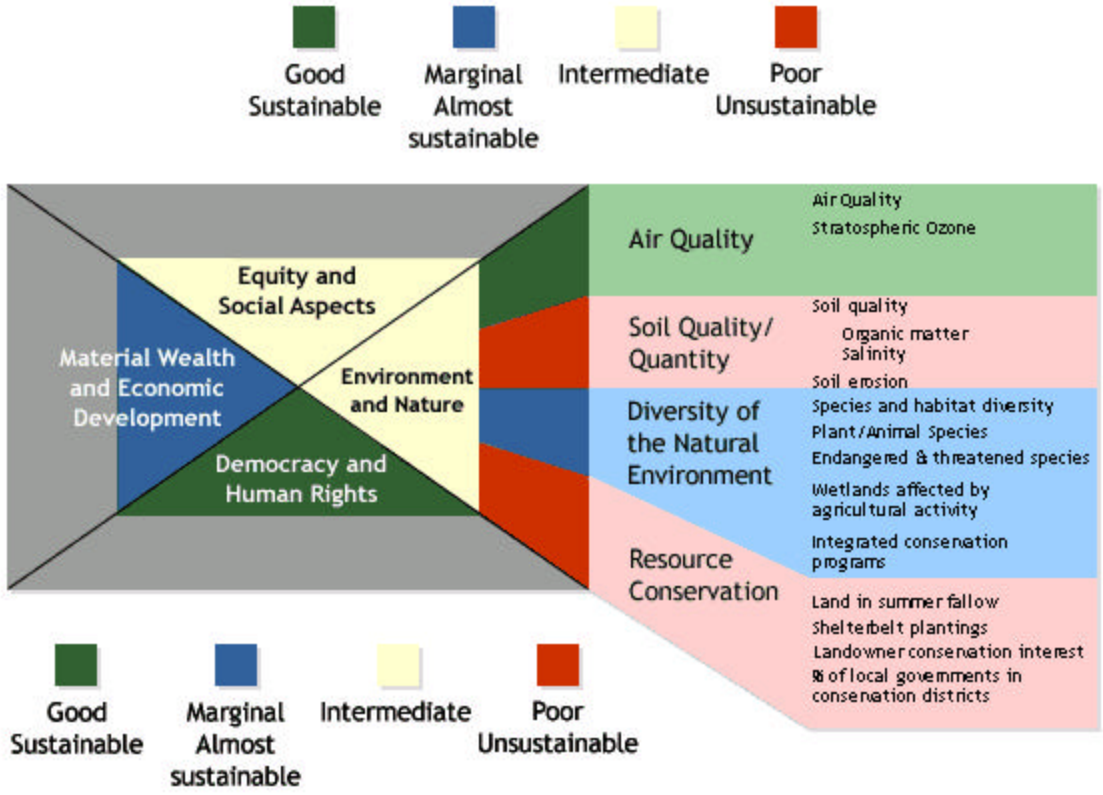
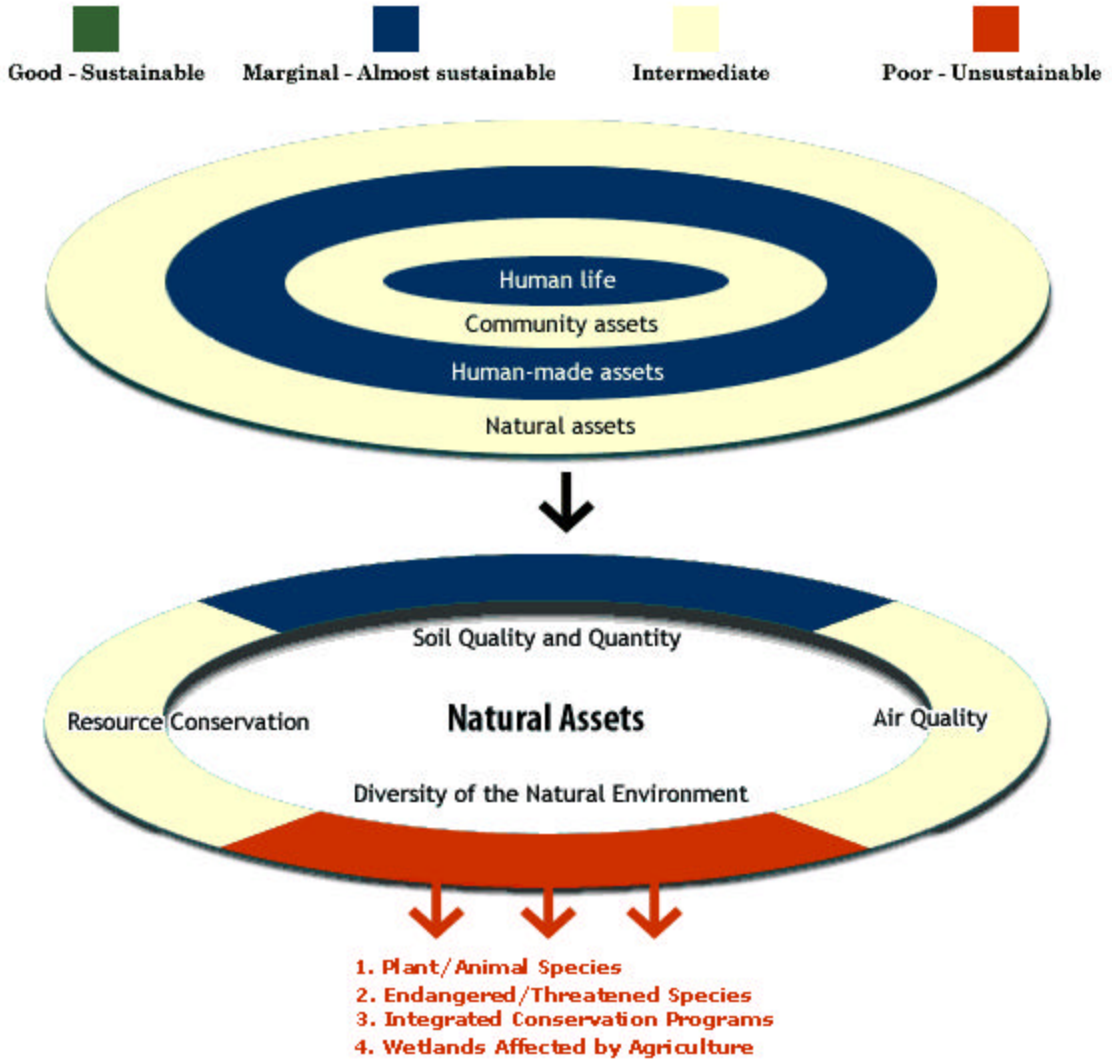
Environmental Standards of Excellence







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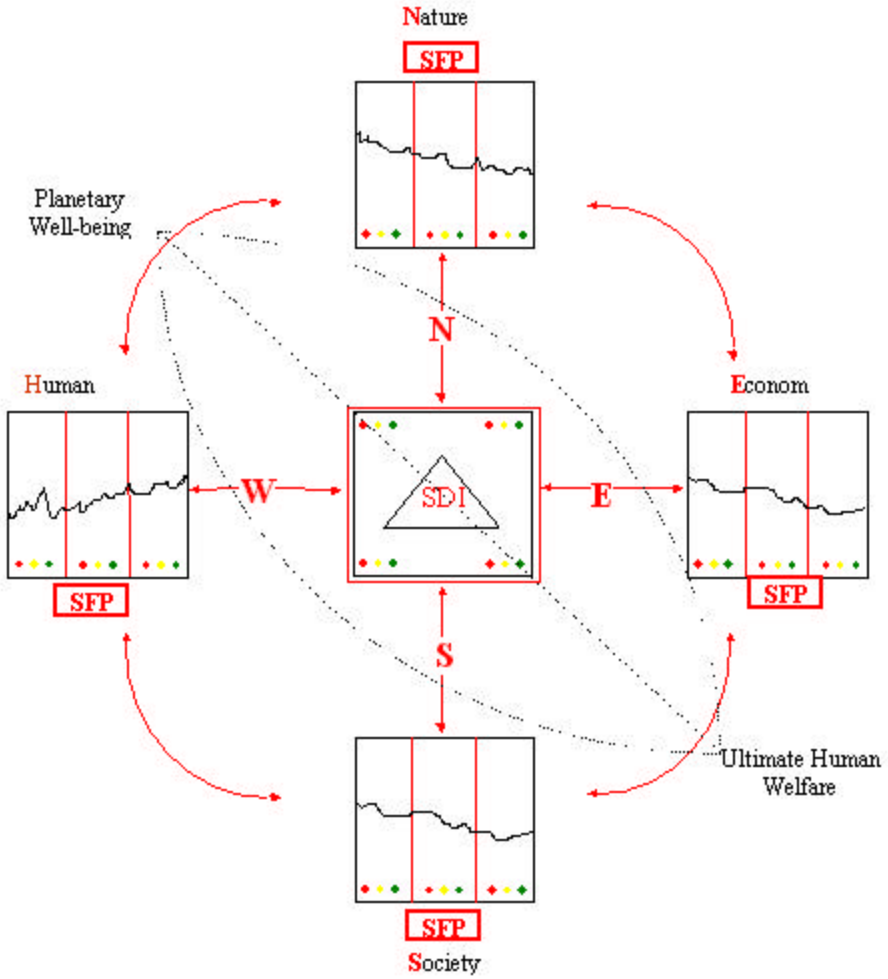

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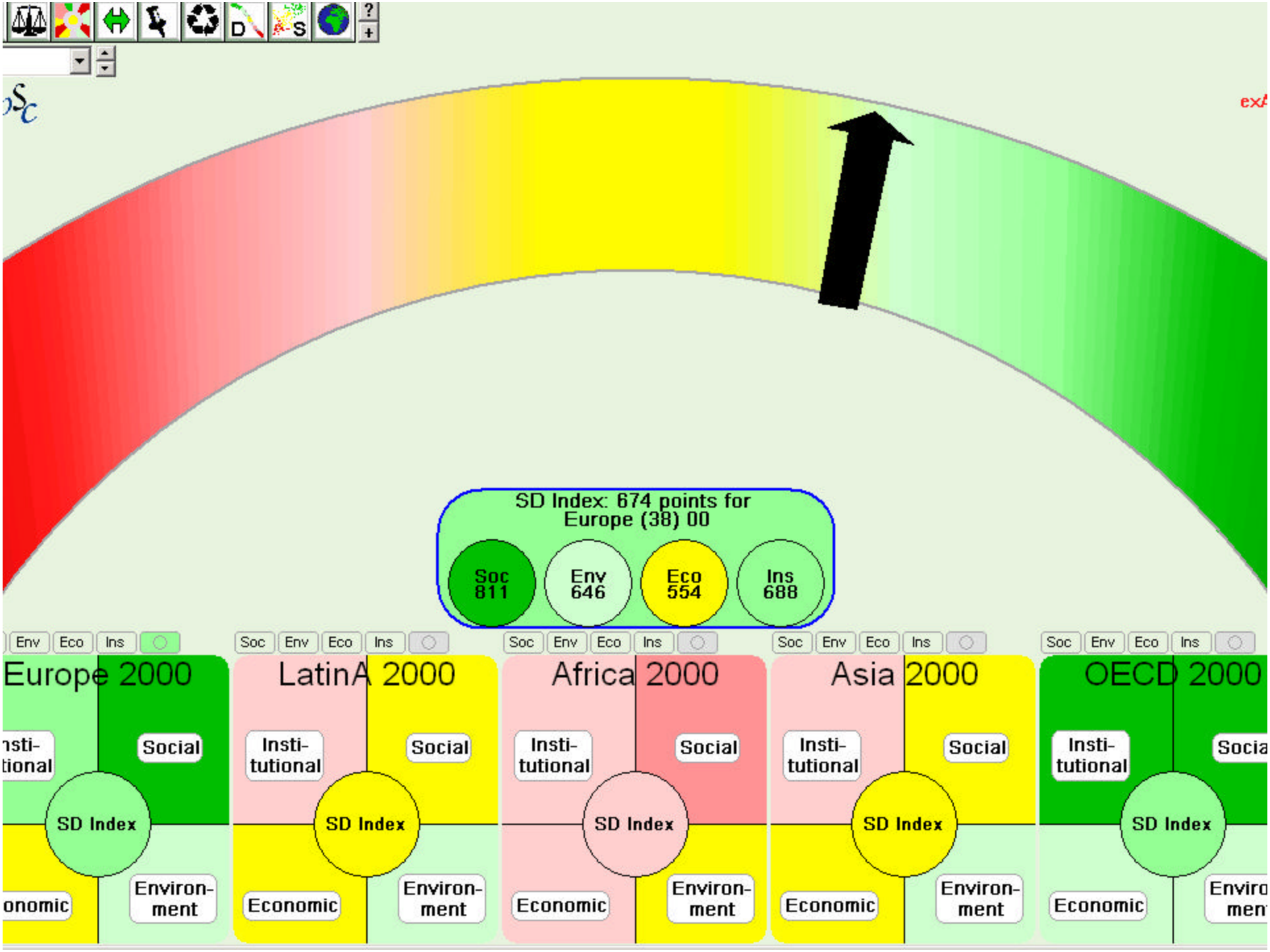
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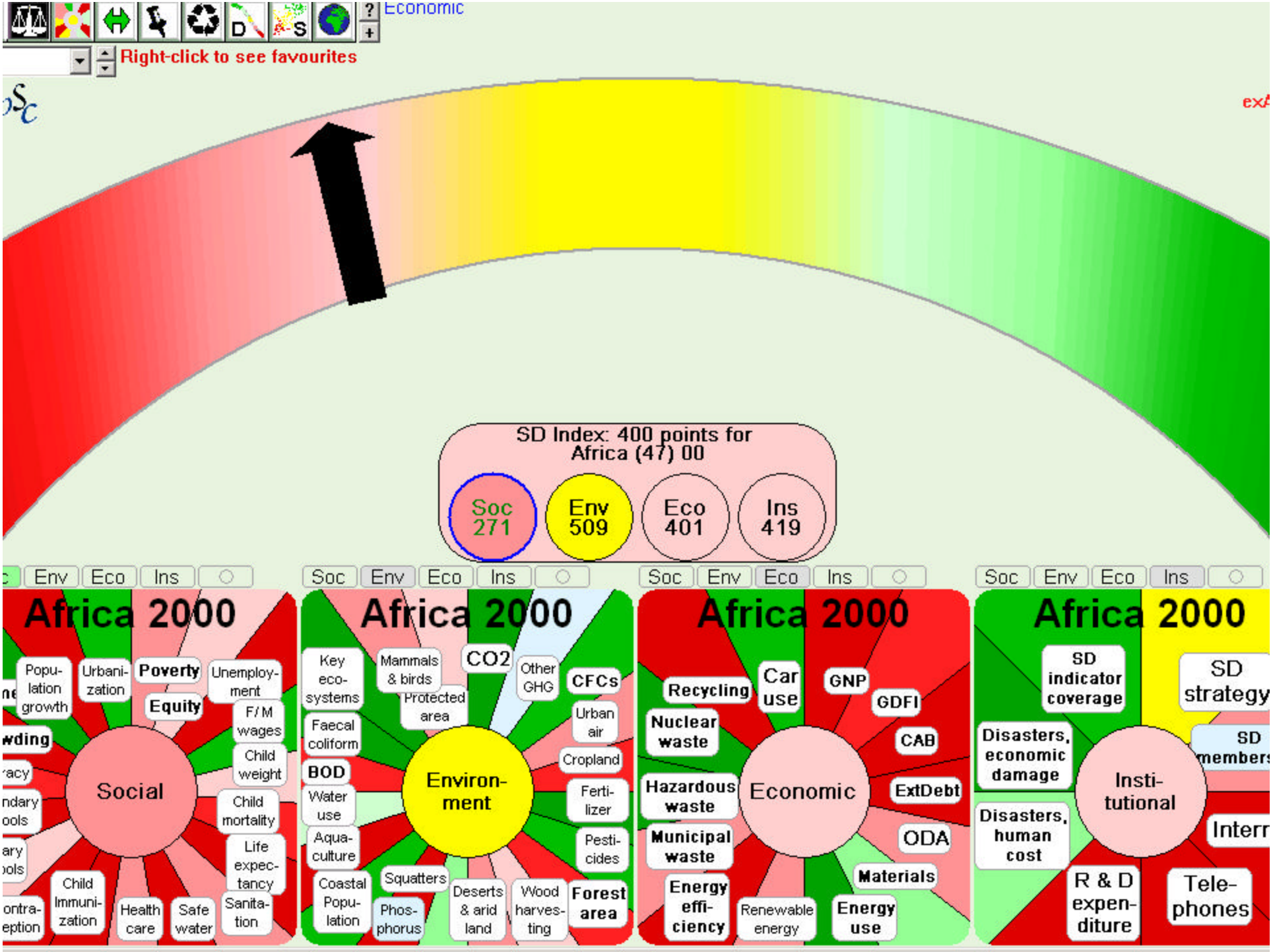
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Equity
F/M wages
Child weight
Child mortality
Life expec-tancy
Sanita-tion
Safe water
Health care
Child Immuni-zation
Environ-ment
Key eco-systems
Mammals & birds
CO2
Other GHG
CFCs
Protected area
Urban air
Faecal coliform
Cropland
BOD
Water use
Ferti-lizer
Aqua-culture
Pesti-cides
Coastal Popu-lation
Squatters
Phos-phorus
Deserts & arid land
Wood harves-ting
Forest area
Economic
Recycling
Car use
GNP
GDFI
Nuclear waste
CAB
Hazardous waste
ExtDebt
Municipal waste
ODA
Materials
Energy effi-ciency
Renewable energy
Energy use
Insti-tutional
SD indicator coverage
SD strategy
Disasters, economic damage
Disasters, human cost
R & D expen-diture
Tele-phones

Common Approach

- Rely on familiar, traditional metrics
- Benchmark
- Consider what else might be tracked e.g GRI, ISO

Environmental Performance Evaluation

- Strategy
- Link to Mission
- A process to:
  - measure
  - analyze
  - assess
  - describe an organization's environmental characteristics and performance
  - agreed criteria for appropriate management review
  - Annual report

Conclusion

- Identify metrics of the future
- Use balanced mix...Map metrics to mission
- Educate Management ...Obtain buy-in
- Make the indicators meaningful for senior management
- Make the indicators understandable to the non-environmental audiences, both inside and outside of DOD
- Utilize data already collected
- Use metrics to motivate behavior
  - Not collect data for data's sake