

# **METRICS FOR SUSTAINABILITY**

**Meeting of the National Academies  
Roundtable on Science and  
Technology for Sustainability**

**John Carberry  
DuPont  
Wilmington, DE  
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# **Goal for the Roundtable**

**Mobilize, encourage, and use scientific knowledge and technology to help achieve sustainability goals and to support the implementation of sustainability practices.**

**How can science and technology contribute more effectively to achieve society's goals of sustainable development?**

**For this particular workshop segment, concentrate on metrics for sustainability. Metrics are a critical part of the process of converting vision into results.**



# **QUESTIONS ABOUT METRICS**

- **What is the purpose of the measurement effort?**
- **What is the intended timeframe for action?**
- **What are the key issues?**
- **How do you set “sustainability” goals for an issue?**
  
- **How do you measure performance for an issue?**
- **How do you compare the issue metric to a performance standard?**
- **How do you relate the metric to the needs of the intended audience?**



# **WELCOME TO**

## **Pine View, Colorado**

**Established 1872**

**Population 732**

**Pets&Lvstk 3478**

**Elevation 4755**

**Weather CBBTB**

**SmTwn QLI >75%**



**WELCOME TO**  
**Pine View, Colorado**

<b>Established</b>	<b>1872</b>
<b>Population</b>	<b>732</b>
<b>Elevation</b>	<b>4755</b>



# **WELCOME TO**

## **Pine View, Colorado**

<b>Established</b>	<b>1872.135</b>
<b>Population</b>	<b>731.752</b>
<b>Elevation</b>	<b>4755.004</b>

**\*Audited by PPS/JGE  
(Pointless Precision  
Sector of Jobs for  
Green Eye-shades)**



# **WELCOME TO**

## **Pine View, Colorado**

<b>Established</b>	<b>1872</b>
<b>Population</b>	<b>732</b>
<b><u>Elevation</u></b>	<b><u>5755</u></b>
<b>TOTAL</b>	<b>8359**</b>

**\*\*Verified by 3iDataCen  
(Formerly, the Center for  
irrelevant, immaterial and  
inconvenient Data)**



# **CHARACTERISTICS**

## **Few**

**Will not confuse the audience with excessive data**

## **Simple**

**Easily understood by a broad audience**

## **Accepted**

**Relevant to the concern of the audience who are also  
in broad agreement with the specifics**

## **Effective**

**Improvement in the metric actually improves the issue**

## **Robust**

**Requires minimal exceptions and footnotes**

## **Durable**

**Remains relatively the same over time**





# **SUCCESSFUL METRICS**

- **Pick your issues**
- **Define your metrics and goals**
- **Get started**
- **Drive continuous improvement of your performance and your metrics. The development and effect of the Toxic**



# **From “Red Storm Rising” by Tom Clancy**

**“... defensive weapons were ... Gatling guns ... in a fully automatic mode, ...missiles came in from aft, not a hundred yards apart. The ... gun tracked on both, but couldn’t decide on which to engage first. It went into Reset mode and petulantly didn’t engage any...”**



# **Study the Lioness**

**Observe how the lioness hunts, selecting her prey with care and preparation. Carefully stalking it, she bursts from cover in single minded pursuit, ignoring a myriad of tasty opportunities fleeing desperately to either side. That lioness usually brings food home for self and cubs. The easily distracted one, frequently stands frustrated, in the midst of a fleeing cacophony, all tantalizingly  
- - - just out of range.**



# **QUESTIONS FOR GETTING STARTED**

- **How do we identify potential sustainability issues?**
- **Are there any truly global issues or will we need to focus at a range of national or regional levels?**
- **Should we try to concentrate on issues that can be significantly addressed through science and technology**
- **Should we try to focus on a few and demonstrate that we can begin to find our way forward?**
- **What previous work should we try to draw upon?**
- **What issues and metrics would we recommend as a place to start?**





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# **HOPES FOR THE ROUNDTABLE**

## **Frame the issues**

- **Energy and renewable energy**
- **Water**
- **Sustainable agriculture**
- **Human and environmental toxicology**
- **Assessment of risk**

## **Help resolve contentious issues**

- **Biomass productivity and energy balance**
- **Passively safe nuclear power with environmentally sound waste disposal**

## **Help set the science and technology R&D agenda**

- **Renewable energy**



# **ISSUES FOR GETTING STARTED**

**Heavily impacted by science and technology**

- **Energy and renewable energy**
- **Water**
- **Sustainable agriculture**
- **Human and environmental toxicology**
- **Assessment of risk**

**Balanced between societal and S&T**

- **Habitat and species preservation**
- **Life style choices**
- **Urbanization**
- **Education**

**Dominated by societal mechanisms**

- **Public commitment to sustainability**
- **Population**
- **Peace**
- **Governance**





# Thank you for your time !!!

