How to Measure/Assess Sustainability in the Future Post-Fossil Fuel Society?

The Coin
The words ecology and economy share common roots — both originate from the Greek word “oikos”, meaning “home”. These common origins illustrate the fundamental link between the environment and our economy.
Limitations of GDP

- It ignores several components that do not involve monetary transactions.
- It fails to assess changes in human capital, and does not account for the circulation of income among individuals, which can enhance personal and social wellbeing.
- It counts every expenditure as positive and does not discriminate welfare-enhancing activity from welfare-reducing activity.
- It ignores different visions of the goals of development, such as cultural differences, overlooking inequities.
- It ignores environmental costs, natural resource depletion rates, and, contradictorily; it includes the costs of environmental remediation as valuable production.
- It disregards longer-term negative consequences of short-term exploitation of the ecosystem and of eco-system's services.
Proposed alternatives and supplements to GDP

Two main approaches:

1\textsuperscript{st} approach - uses GDP as foundation to build a complete index:
   - greening GDP
   - Socializing GDP

2\textsuperscript{nd} approach – indices are constructed independently of GDP
   - environmentally oriented indicators
   - socially oriented indicators
1st approach
greening or socializing GDP

- Limitations:
  - the subjectivity in deciding which expenses are valuable and must be added to the total and which are disruptive, and must be subtracted;
  - the need for consensus on how to value social and environmental items that are not reported in monetary terms (ecosystems services, natural resources, volunteer labor or illegal activities);
  - the need for consensus on how to quantify the costs of natural resources depletion;
  - the subjectivity of selecting and classifying the most representative variables and/or indicators that form the basis of the indices.
2nd approach
Efforts to redefine the indicators

• Environmentally oriented indicators
  – consider the environmental limits to develop and growth.
  – designed to monitor carrying capacity, instead of measuring societal progress

• Socially oriented measures
  – based on the judgments of the survey respondents
  – cultural differences make it complex to compare the results across different ethnic, gender, age, religion, and other cultural boundaries.
2nd approach
Combining social and environmental concerns

• Composite indexes
  – merge different measures into a single number consisting of GDP plus social and environmental concerns
  – uncertainty and methodological approaches are still foremost issues both in constructing the indices as well their use by decision makers.
  – social and environmental development may have opposite directions.

• Set of indicators
  o troublesome to understand by the general public and stakeholders
  o allow incomplete or biased interpretations by groups with particular interests or limited knowledge.
What indicators may be used to evaluate progress?

• All attempts to measure progress have attracted criticism regarding:
  
  • valuation techniques and methods
  • limitations and scope.
Can measures of well-being and progress help societies to achieve SD?

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<tr>
<th></th>
<th>GDP</th>
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<th>HLY</th>
<th>LY</th>
<th>D. Index</th>
<th>EF</th>
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- R: renewable natural resources; N: non-renewable resources; F: resources from the economy; EYR: Emergy Yield Ratio; ELR: Environmental Load Ratio; ESI: Environmental Sustainability Index; GDP: Gross Domestic Product (GDP); Gross Domestic Product (GDPpc); HDI: Human Development Index, HLY: Happy Life Years, LY: life years, EF: Ecological Footprint; SB: Biocapacity Surplus; Democracy Index (D. Index); WI: wellbeing Index, ESI-2002: Environmental Sustainability Index-2002.
Can measures of well-being and progress help societies to achieve SD?
Can measures of well-being and progress help societies to achieve SD?

**Sustainability dimensions**

- **SB**
- **ESI-2002, WI**
- **LY, HLY, D.Index**
- **EF**
- **HDI**
- **GDP, GDPpc**

**Emergy indices**

**Environmental capital**
- renewable and non-renewable resources
- Fuels, Minerals,
- Clean air and water

**Human work**
- Information, health and education
- $\rightarrow$

**Necessary interaction**

**Population**
- Pollution, crime, luxury, ...

**Socio-economic cycle**
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All attempts to measure progress have attracted criticism regarding certain valuation techniques, limitations and scope.

Consequently, there is a need for a global dialogue and consensus on these issues, and there are still some questions that need help from the academic, social and political communities to be answered.
• How to Measure/Assess Sustainability in the Future Post-Fossil Fuel Society?

• What indicators may be used to evaluate progress the Future Post-Fossil Fuel Society?

• How will they be measured?

• What can be done within the possibility of the existing accounts?

• Who will select those indicators for in the Future Post-Fossil Fuel Society?

• To whom those indicators are of interest in the Future Post-Fossil Fuel Society?