

The True Value of Sustainable Investments: How Time Shapes the Costs and Benefits for Society and the Environment

Department: Copernicus Institute of Sustainable Development

Research group: Energy & Resources, Environmental Science

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Project description

Are you interested in how economics and environmental science come together to shape sustainability policy? Would you like to contribute to a paper that helps policymakers make better-informed decisions about the future? Then this research opportunity might be for you.

Reducing energy use, greenhouse gas emissions, air pollutants, and other environmental waste is at the heart of environmental policy. To support decision-making, economists and environmental scientists rely on tools such as environmental cost-benefit analysis and marginal abatement cost (MAC) curves. These tools help determine how much it costs to avoid one ton of CO₂, methane, or nitrogen emissions compared to a reference alternative, or how much per gigajoule (GJ) of clean energy a sustainable solution provides.

A key challenge in these analyses is how to value time. Many sustainable solutions require higher upfront investments but deliver cost savings, environmental benefits, and avoided societal damages in the long run. Because money today is valued more than money tomorrow, these solutions often appear less attractive in conventional cost-benefit analysis, even when they are clearly better for society and the planet.

A related question concerns the time value of physical environmental indicators themselves. Should one ton of CO₂ reduced today be valued differently than one ton reduced ten years from now? Some argue that early reductions are more valuable, as they help prevent overshooting the global carbon budget and crossing climate tipping points. Yet, in both peer-reviewed research and grey literature, there is little consensus—and even less clarity—on how such temporal valuation should be reflected in cost-benefit and marginal abatement cost analyses.

In this project, the Bright Mind Assistant will:

- Conduct a systematic literature review across disciplines such as environmental economics, life-cycle assessment, carbon offsetting, and carbon sequestration.
- Map how different fields handle the time value of environmental impacts.
- Contribute to the development of a transparent and consistent guideline for incorporating time and environmental indicators in cost-benefit analysis.
- Work toward co-authoring an academic paper that synthesizes the findings and proposes a way forward for research and policy.

Project proposal Bright Minds Assistantships – February 2026

Job requirements

We are looking for a motivated and analytically student with a strong interest in research methods & theory. Background knowledge in Cost-benefit analysis (CBA), net present value (NPV), levelized costs of energy (LCOE), marginal abatement costs curves (MACCs), real & nominal values, is a prerequisite.