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Preview

EU Sustainability Performance Tier Classification

Contributor: Thrive
Organization: Kiron
Organization origin: Germany
Tested in: Germany

Type: Social impact | Stage: Prototype

Social use case attributes

Industry

Government and Public Services • Others

SDG alignment

SDG 1: No poverty • SDG 2: Zero Hunger •
SDG 3: Good Health and Well-being •
SDG 4: Quality Education • SDG 5: Gender Equality •
SDG 6: Clean Water and Sanitation •
SDG 7: Affordable and Clean Energy •
SDG 8: Decent Work and Economic Growth •
SDG 9: Industry, Innovation and Infrastructure •
SDG 10: Reduced Inequalities •
SDG 11: Sustainable Cities and Communities •
SDG 12: Responsible Consumption and Production •
SDG 13: Climate Action • SDG 14: Life Below Water •
SDG 15: Life on Land •
SDG 16: Peace, Justice and Strong Institutions •
SDG 17: Partnerships for the Goals

Impact

Improved Policy and Decision-Making

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Type: Social impact | Stage: Prototype

Brief description

This project uses machine learning to classify European countries into three sustainability performance tiers based on selected SDG indicators. The analysis highlights which policy areas (e.g., digitalization, renewable energy, governance) are most predictive and provides insights into pathways for improvement.

Problem statement

The EU faces persistent disparities in sustainable development progress across member states. Some countries are leaders, while others lag behind on key indicators such as income equality, renewable energy, or governance quality. Policymakers need clear evidence on where to focus efforts to close these gaps. Critical assumptions: Reliable SDG indicator data is available across countries and years; machine learning models can identify meaningful patterns and distinguish performance levels.

Impact

Improved Policy and Decision-Making

Beneficiaries

Children and Youth • Elderly Population • Low-income Communities • Refugees and Displaced Persons • People with Disabilities • Women and Girls • Indigenous People • General Public • LGBTQ+ Community • Others

AI capabilities

Analysis • Embodiment • Generation

Data source

Structured

Technology type

Supervised learning

Implementation & ethical AI

Risk classification

Low risk

Success metrics

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The idea or concept

We propose an AI-based classification system that groups EU countries into performance tiers and identifies the most influential drivers of sustainability. By analyzing SDG indicators with machine learning, the project generates actionable insights for targeted policy interventions and long-term planning.

Who are the users?

Primary users: EU policymakers and institutions (e.g., European Commission, national governments). Think tanks and sustainability research organizations. Civil society groups advocating for sustainable development.

Goal

The goal is to validate whether machine learning can accurately classify sustainability performance tiers (>90% accuracy achieved) and identify the top predictive features. At this stage, we are testing the feasibility and usefulness of such models for policy analysis.

Success metrics

Societal benefit in economical value • Others

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Outcome

The prototype successfully classified countries into three tiers with high accuracy (~98% with Gradient Boosting). Key predictive features include digital adoption, renewable energy share, governance quality, and income levels. Results align with expectations, showing clear tier differences.

Learnings

Machine learning models can provide reliable, interpretable insights for sustainability analysis.

Gradient Boosting outperformed other models (Logistic Regression, Random Forest) in accuracy and balance.

Feature importance analysis revealed consistent policy drivers across models. What could be improved: Incorporating more SDG indicators (beyond the 15 selected) and testing robustness across time horizons.

Critical milestones & next steps

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Learnings

Machine learning models can provide reliable, interpretable insights for sustainability analysis.

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Critical milestones & next steps

Next steps: Expand analysis to the full set of 100+ SDG indicators for richer insights. Develop a simple dashboard for policymakers to visualize country tier classification and recommendations. Collaborate with EU institutions for validation and refinement. Challenges: Ensuring continuous access to harmonized, high-quality data; translating model outputs into actionable, context-specific policies.

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Next step