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Perspectives on Education: Energy and Management for Sustainable Development

ERASMUS+ LETSEMA KICK-OFF SEMINAR

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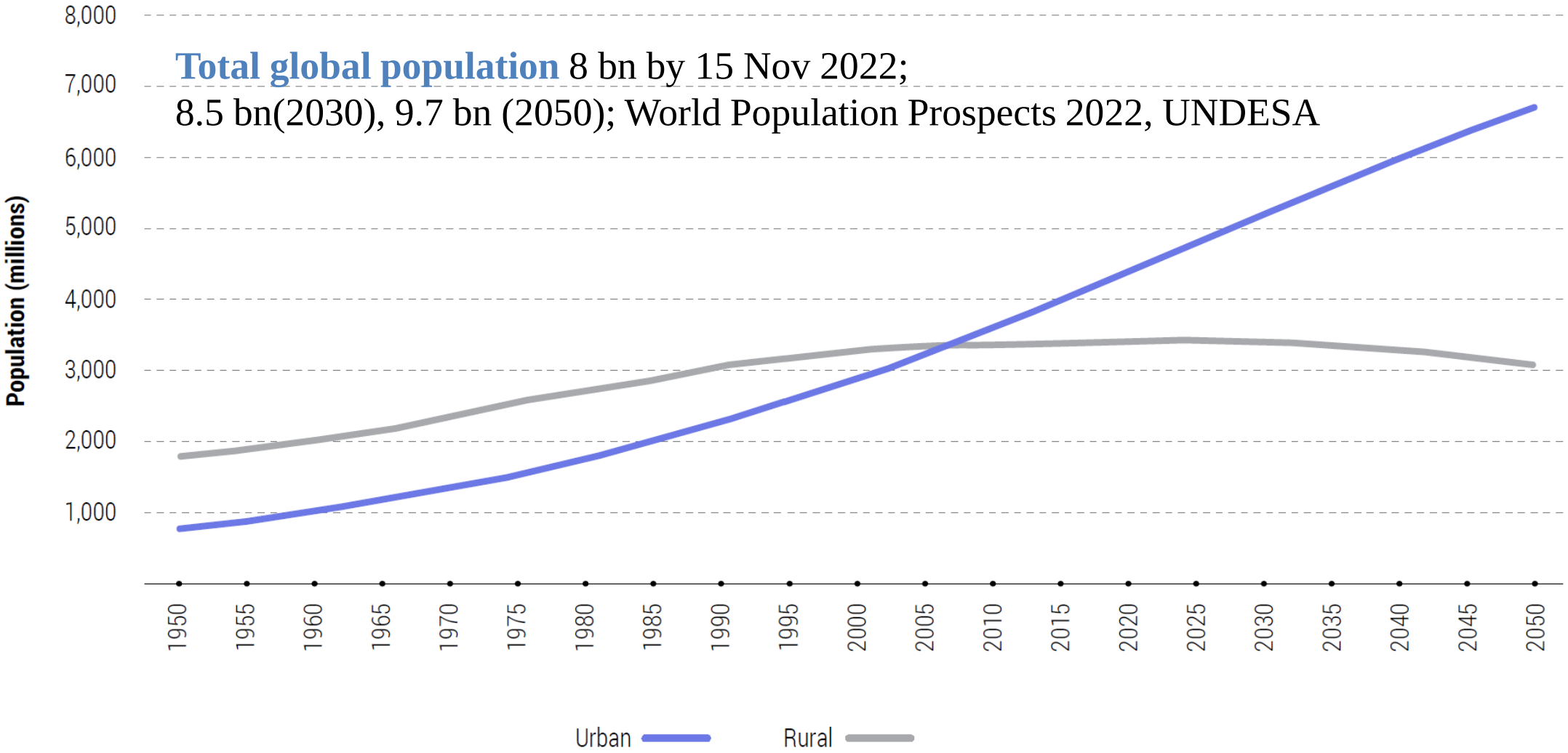
Content of my presentation

- Examples of Global and Local Sustainability Challenges
- Interlinked Questions Pertaining to Energy Sustainability
- How should these questions to be addressed in Sustainability Related Educational Programme
- Experience from Swedish MSc programme on Energy and Management for Sustainable Development

World Population (Urban and Rural) by 2050



2050 – The Challenge

The Organisation for Economic Co-operation and Development predicts

9.7
Billion
People

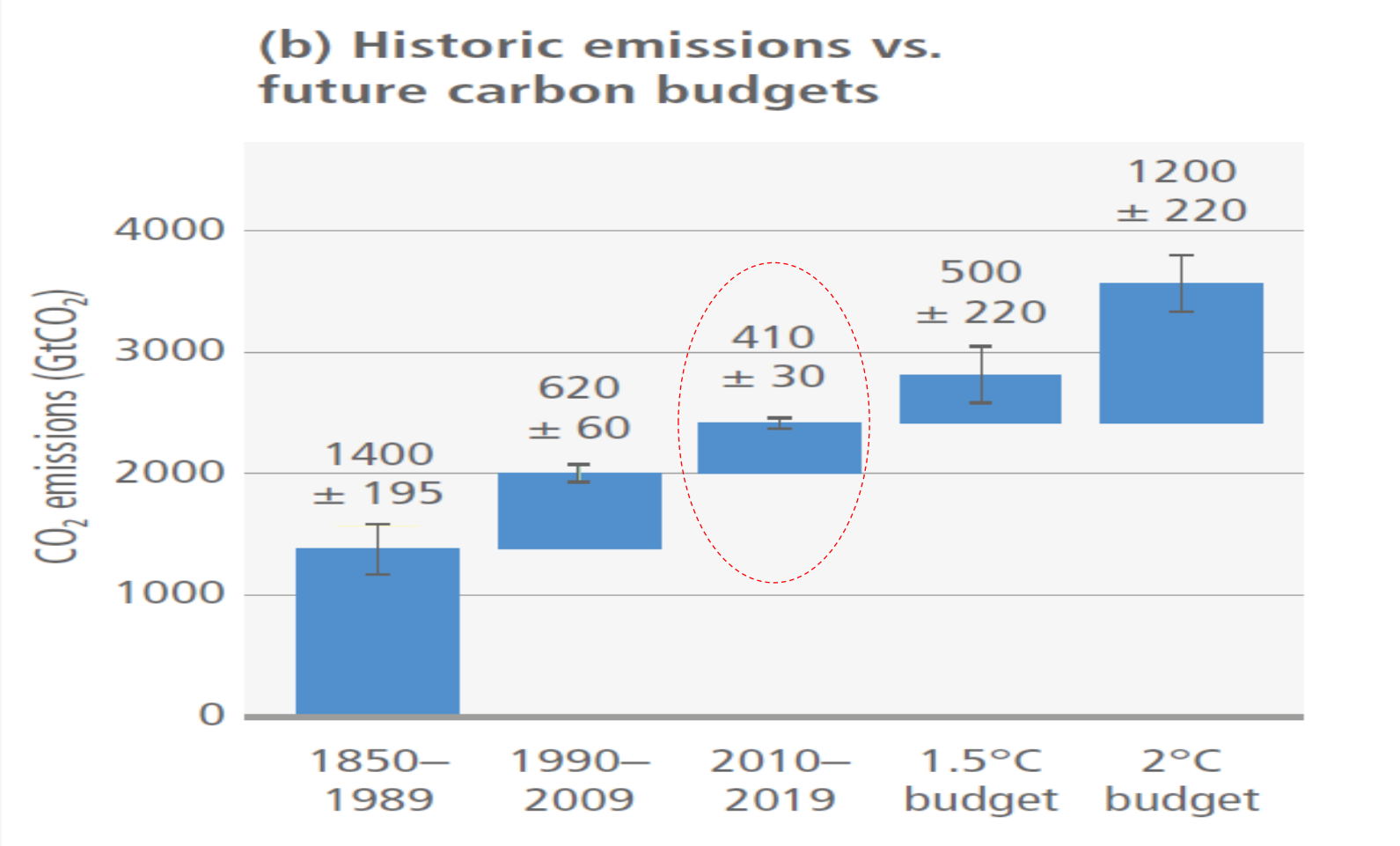
60%
More
Food

55%
More
Water

80%
More
Energy

Source: OECD Environmental Outlook to 2050

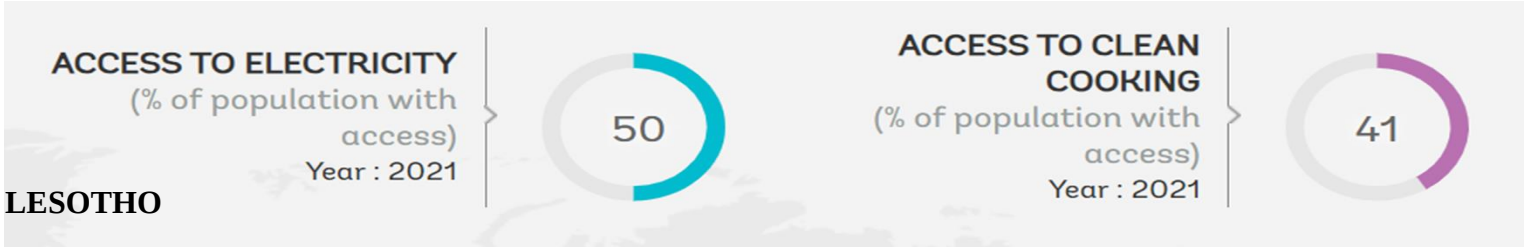
Remaining carbon budgets for limiting warming to 1.5°C and 2°C



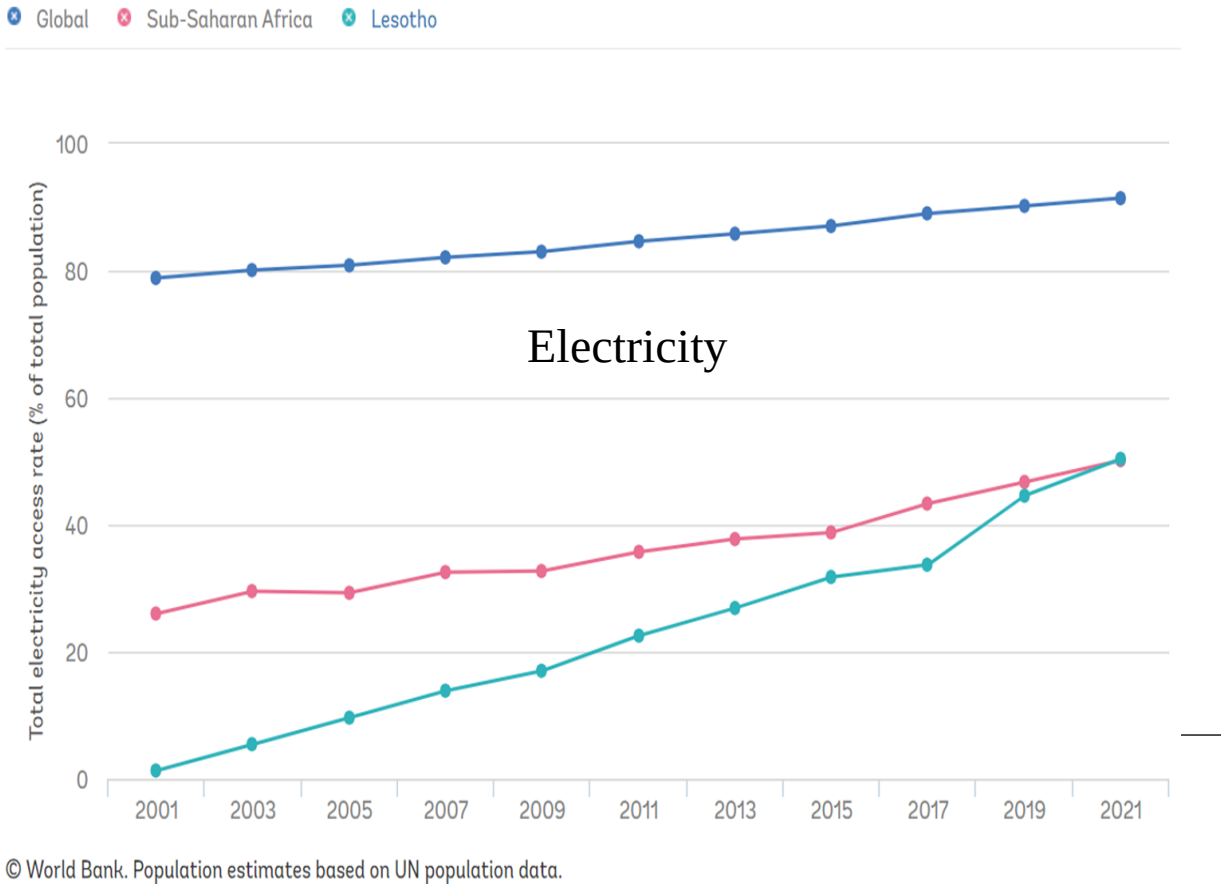
Cumulative net CO2 emissions of the last decade (2010–2019) are about the same size as the remaining carbon budget for keeping warming to 1.5°C →WE ARE NOT ON TRACK TO LIMIT WARMING TO 1.5°C.

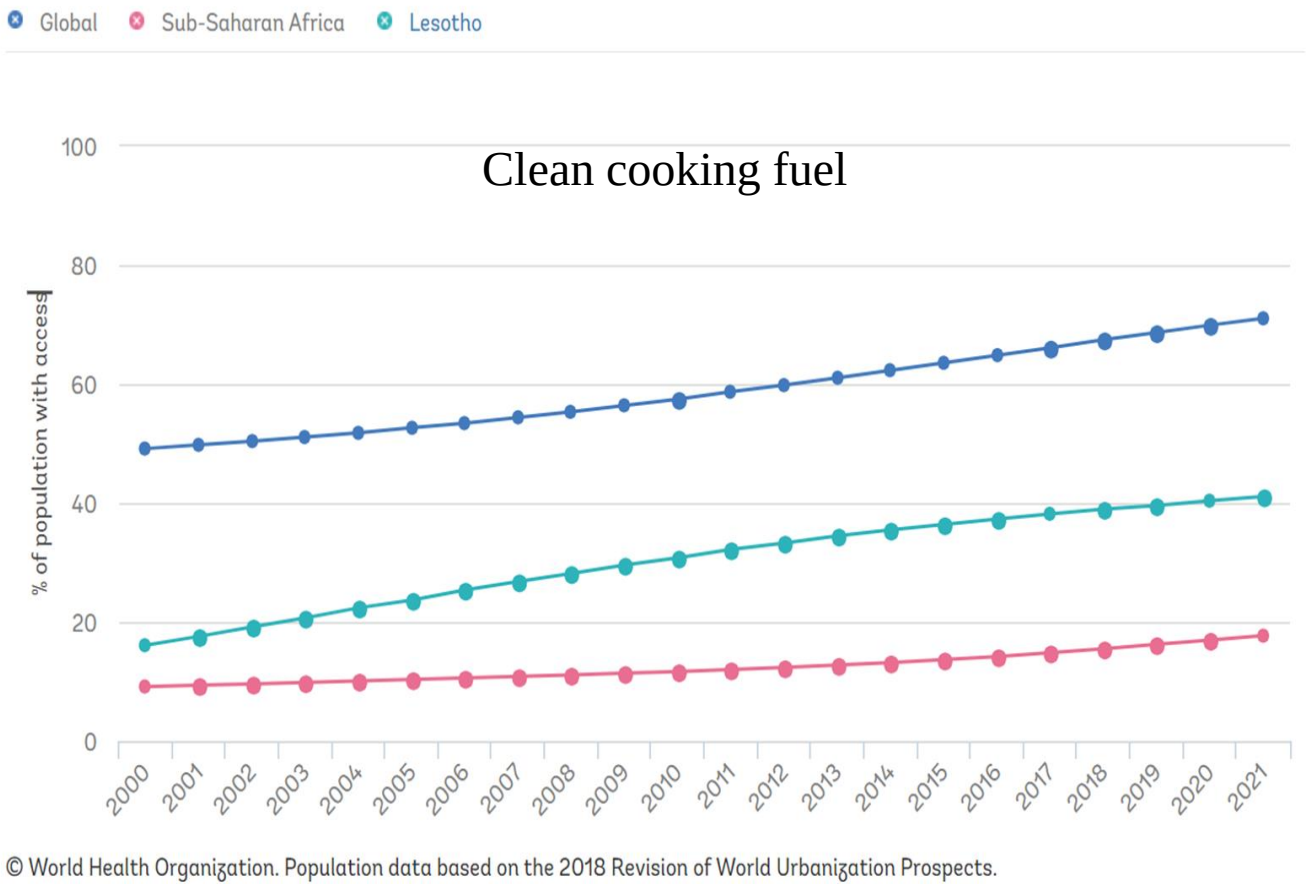
Source: Dhakal, 2023

Electricity/ Clean cooking fuel Access Progress tracking (2001-2021):



Source: https://trackingsdg7.esmap.org/



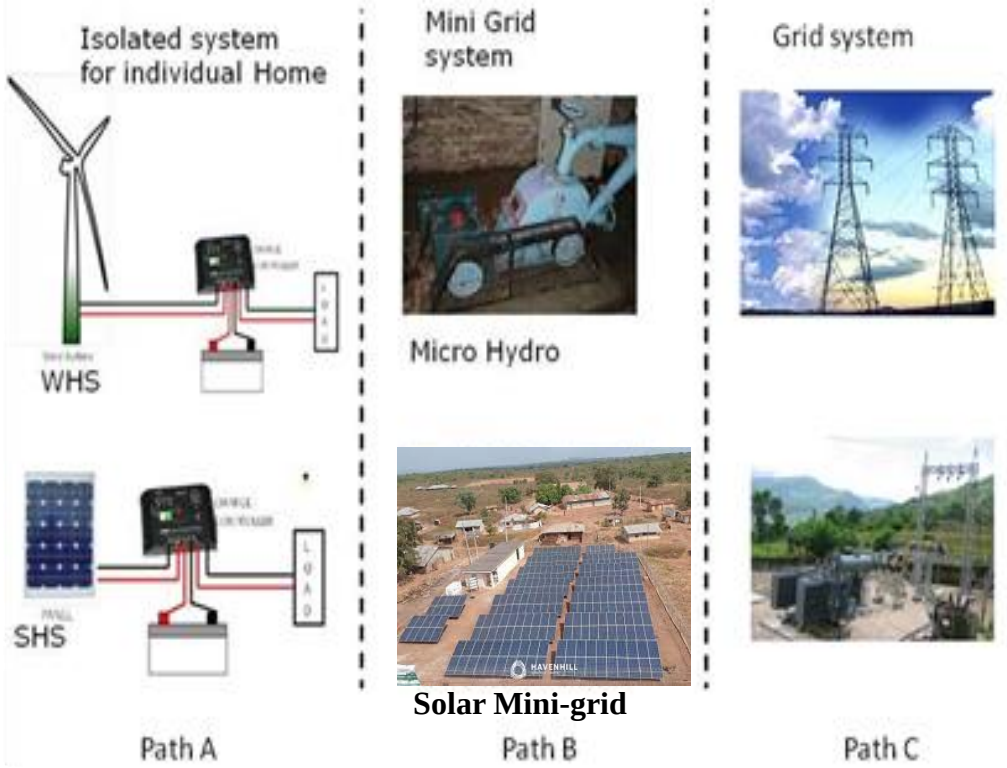


Choice of pathways for providing access to electricity in developing countries

The choice of electrification pathways and technological alternatives often goes beyond individual choices and are influenced by policy, supply companies, NGOs and village economy.

If we look upon electrification history, in many developing countries electrification pathways are promoted in parallel without proper long term planning with cost effective analysis.

Given the limited resources, cost effective pathways has to be chosen.



Mainali and Silveira, 2013

[Alternative pathways for providing access to electricity in developing countries]

Interlinked Questions Pertaining to Energy Sustainability: *Challenges & Opportunities*

Energy Security

- How to accelerate access to modern energy services and decrease heavy reliance on imported energy,
- How could we diversify our energy mix to insecure security of supply?
- How can we improve domestic renewable energy production and enhance energy efficiency?

Climate Change

- How much will climate change impact the reliability of energy production (eg: hydropower generation)?
- How are we going to deal with the problem posed by climate change on energy security, water scarcity, and food security?

Urban Transition

- How to cope with growing energy needs of expanding cities without compromising environmental integrity and considering climate change?
- How energy infrastructure need to be design or redesign with system innovation for sustainable cities?

Socio-Technical Transition

- How can we effectively guide socio-technical transitions towards sustainable energy?
- How can governance and policies support energy transitions?
- How can we ensure gender considerations and equitable access are integrated into sustainable energy transition?

Education/Training Programme for addressing Energy Sustainability challenges

- ✓ Understanding the complexities of developmental challenges is paramount. We are living in a resource, climate constrained world, finding urgent, and holistic solutions is imperative to ensure its livability.

- ✓ We advocate for an educational programme that develops the next generation of engineers, policy experts, and planners, entrepreneurs with deep **knowledge** of global sustainability challenges, holistic system thinking **abilities**, and equip with **skills** to effectively provide the innovative solutions to deal with those challenges.

MSc. Energy and Management for Sustainable Development- LNU

Objective: EMSD programme is tailored for **engineers and technologists** to study and gain an understanding of symbiotic and systematic relationships between energy, climate and sustainable development, and to create innovative solutions.

Students will learn

- Various sustainability paradigms and analytical tools viz. life cycle analysis, life cycle costing, Levelized cost of energy, and environmental accounting, which are important for making environmental decisions.

- Understand and Analyze
  - green financing role in enabling inclusive growth and accelerate the shift to a resource-efficient society and decarbonizing of the economy.
  - role of private sector in climate-smart technologies, scale-up capabilities, transformative innovations, and green capital to meet the sustainability challenges at hand.

- External reporting of energy- and sustainability-related actions that extends accountability of companies to the society in which companies operate.

- Various energy policy instruments, evaluation techniques, and developing innovation strategies, and their impact on investment decisions and public behavior from a sustainability perspective.

MSc. Energy and Management for Sustainable Development- LNU

Built Env and Energy Tech

1st Year (Sem 1)

- Energy and Climate
- Environmental Analysis Methods
- Scientific theory and method
- Diffusion of Innovations for a Sustainable Built Environment

2nd Year (Sem 1)*

- Energy Policy Design and Evaluation
- Life Cycle Analysis (LCA)
- Energy Management in the built environment

(* Students can have exchange opportunities)

School of Business

1st Year (Sem2)

- Innovation, Entrepreneurship and Sustainability
- Management of sustainable innovations in organizations
- Circular Economy and Green Financing
- Environmental Accounting

2nd Year (Sem 2)
Masters thesis

Potential Career

Our Students will become attractive on the labour market and can, among other things, work as:

- ❑ Sustainability manager
- ❑ Energy and environmental engineer
- ❑ Energy system planner
- ❑ Energy strategist
- ❑ Environmental coordinator
- ❑ Environmental investigator
- ❑ Energy project manager
- ❑ Product development analyst
- ❑ Energy Entrepreneur

Strategies for Holistic Sustainability Education and Action

- Foster interdisciplinary collaboration for covering multidimensional sustainability challenges
- Knowledge pooling from various local universities o where so needed
- Establish partnerships and networks with international institutions for global knowledge sharing and collaboration
- We encourage students to understand regional and global contexts while developing locally required skills
- Engage local stakeholders from various sectors for inclusivity and relevance and making our product market ready
- Provide experiential learning through fieldwork, internships, and community projects
- Promote challenge-driven education and innovation in sustainable development
- Integrate digital technology for teaching, learning, and research purposes

For more information
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