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SDG

An Important Journey into Sustainability and Why it Matters

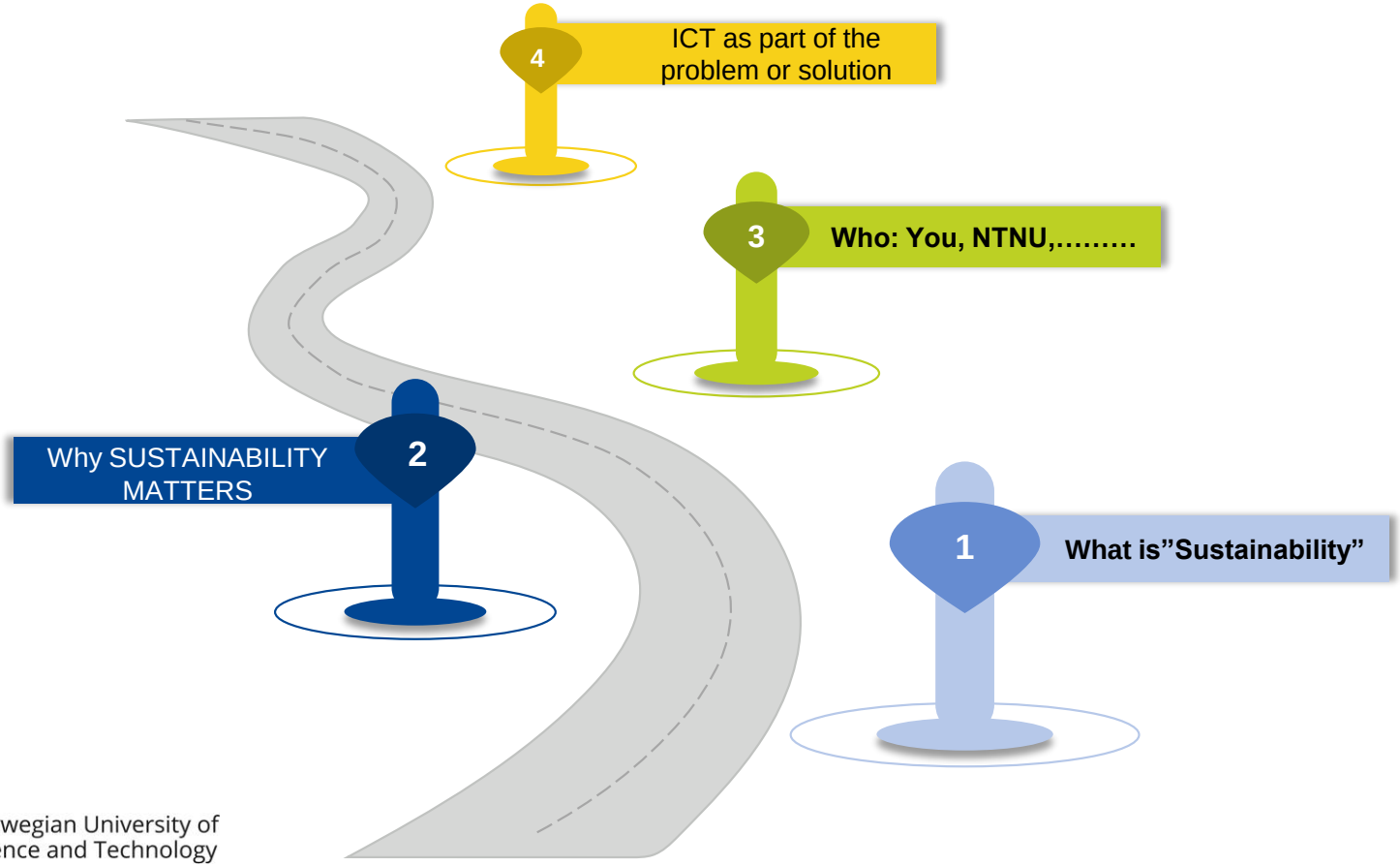
ICT for Sustainability

TTM4175 - Introduction to Communication Technology and Digital Security

Faculty of Information Technology anElectrical Engineering
Department of Information Security and Communication Technology

Iwona Windekilde,
Associate Professor
Department of Information Security and Communication Technology (IIK)
E-mail: iwona.windekilde@ntnu.no
Electro B, A – 277, Gløshaugen

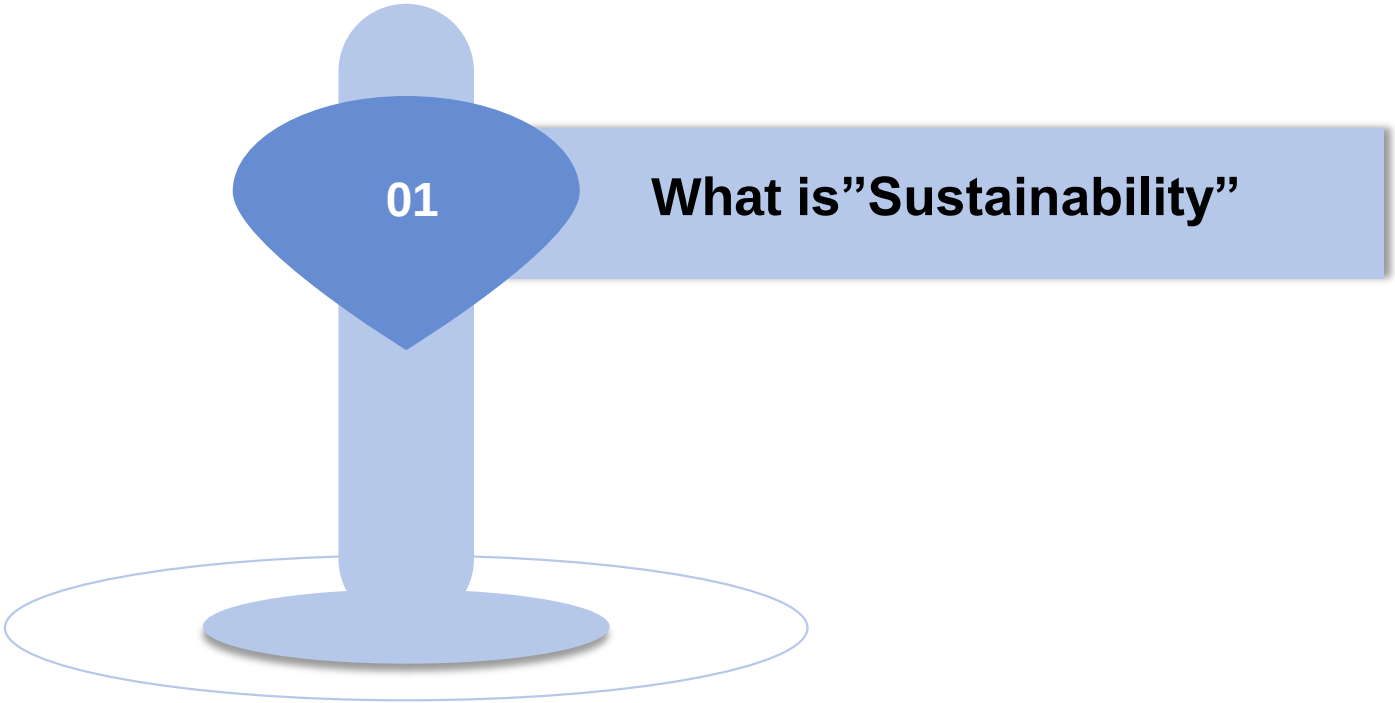
ROADMAP TO SUSTAINABILITY



Why Should We Care?

If we won't, **WHO** will?

And if not now, **WHEN**?"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What is”Sustainability”

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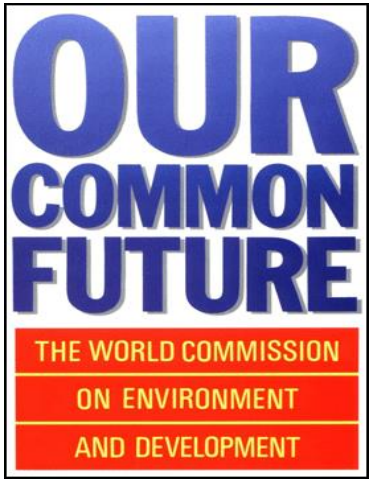
The Brundtland Commission – United Nations, 1987

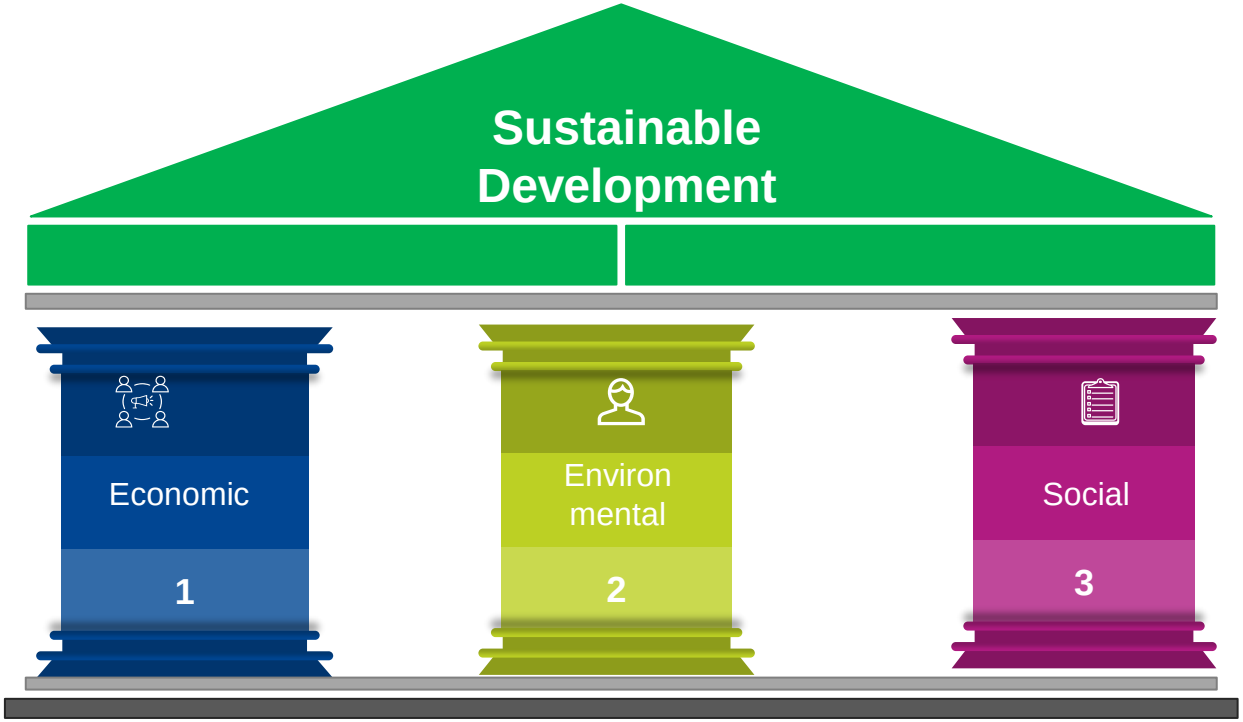


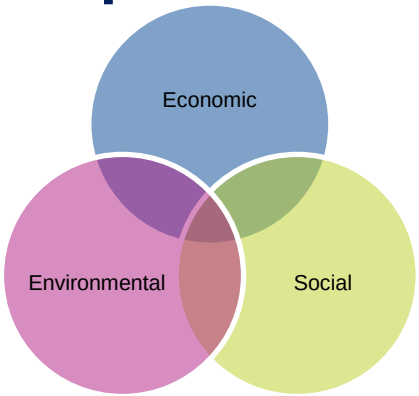
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

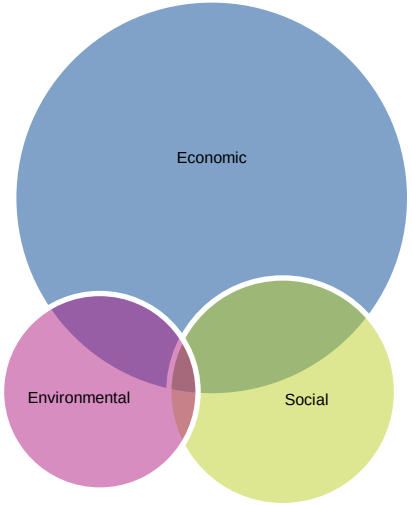
Mother of Sustainable Development
Norway's first female Prime Minister Gro Harlem Brundtland

Sustainability is the capacity to endure

Visual Representations of Sustainable Development







A balance can only exist between entities that are in principle independent but connected

“No one will be left behind”

Sustainable Development Goals: Improve Life All Around The Globe

Agenda 2030 and the Sustainable Development Goals

The 17 Goals were adopted by all 193 UN Member States in 2015, as part of the 2030 Agenda for Sustainable Development which set out a 15-year plan to achieve the Goals.

Three key characteristics of the SDGs

Universality

- These Goals apply to *every* nation and every sector.
- Cities, businesses, schools, organizations, *all* are challenged to act.

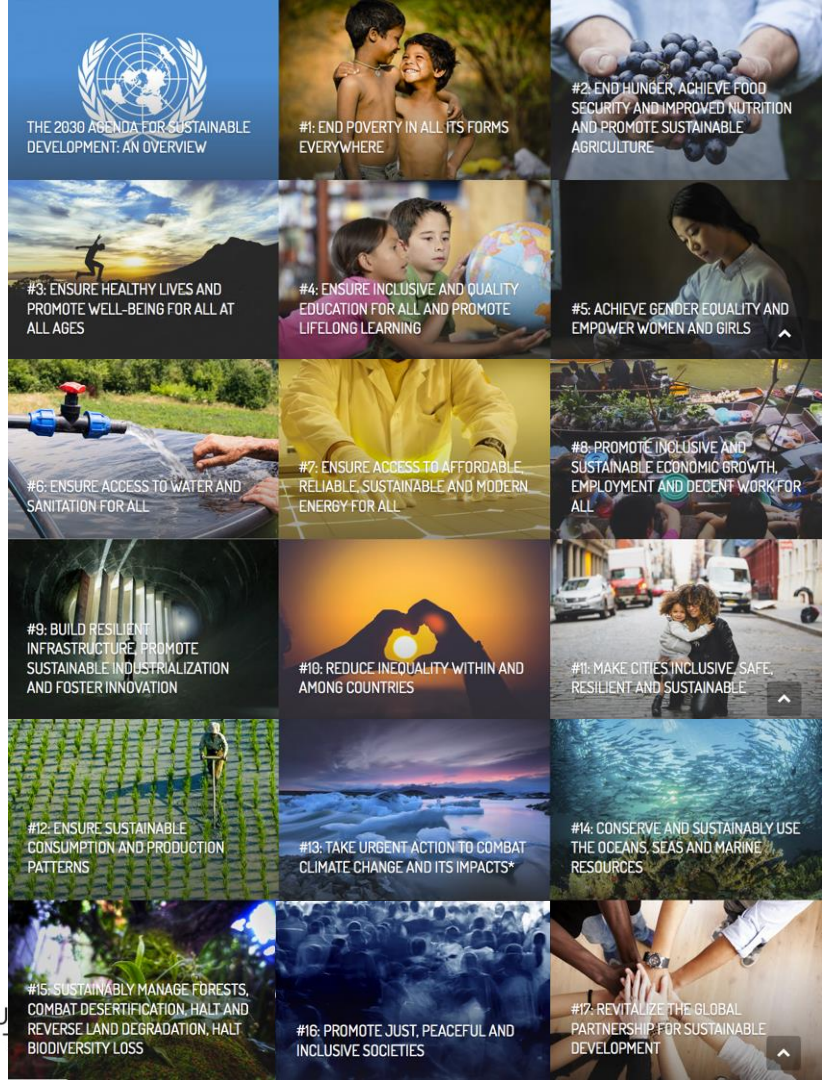
Integration

- The Goals are all inter-connected, in a system.
- We cannot aim to achieve just one Goal. We must achieve them all.

Transformation

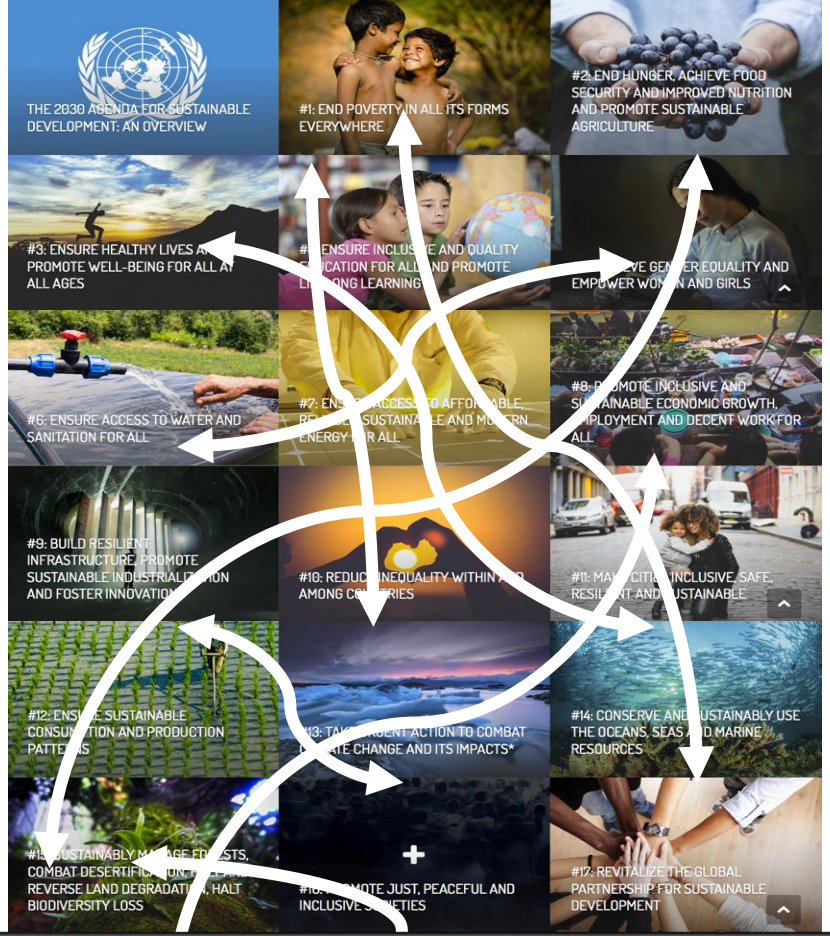
- It is widely recognized that achieving these Goals involves making very big, fundamental changes in how we live on Earth.

Each goal is Important in itself …



17Goals, a multi-stakeholder partnership.

Each goal is Important in itself …



And they are all connected

"The interlinkages and integrated nature of the SDGs are of crucial importance in ensuring that the purpose of the new Agenda is realized"

17Goals, a multi-stakeholder partnership.

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WHY SHOULD WE CARE?

The path to 1.5°C

- The path to 1.5°C requires that the world achieve zero emissions **before 2050.**

If current trends persist, then global temperatures can be expected to rise by

3.2 to 3.9°C

Limit the temperature increase to **1.5°C**

This target require unprecedented changes in our lifestyle, energy and transport systems

> **Now must be the time for ambition and action. I look forward to welcoming first movers and doers at my Climate Ambition Summit in September. The world is watching – and the planet can't wait."**
>
> **ANTÓNIO GUTERRES**, *United Nations Secretary-General*

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What's the difference between 1.5°C and 2°C of global warming?

Source: ClimateChange GlobalWarming COP26

The Doughnut economics of social and planetary boundaries

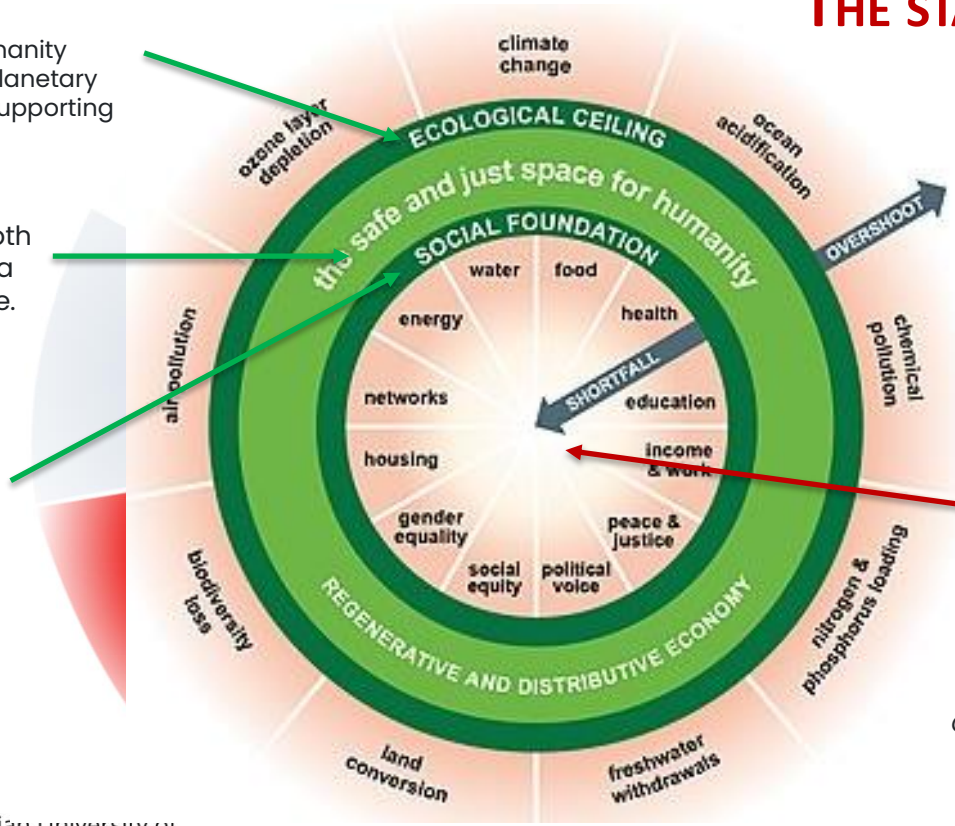
- visual framework for sustainable development

THE STATUS OF TODAY

Ecological ceiling, to ensure that humanity does not collectively overshoot the planetary boundaries that protect Earth's life-supporting systems.

Doughnut-shaped space that is both ecologically safe and socially just: a space in which humanity can thrive.

Internationally agreed minimum social standards



We are currently operating **OUTSIDE** both sets of boundaries, facing both human deprivation and **ENVIRONMENTAL DEGRADATION:**

Inside

- The proportion of **people** that **lack access to food, energy……..**

Compass for human prosperity with the aim of meeting the needs of all people within the means of the living planet.

Kate Raworth, 2012

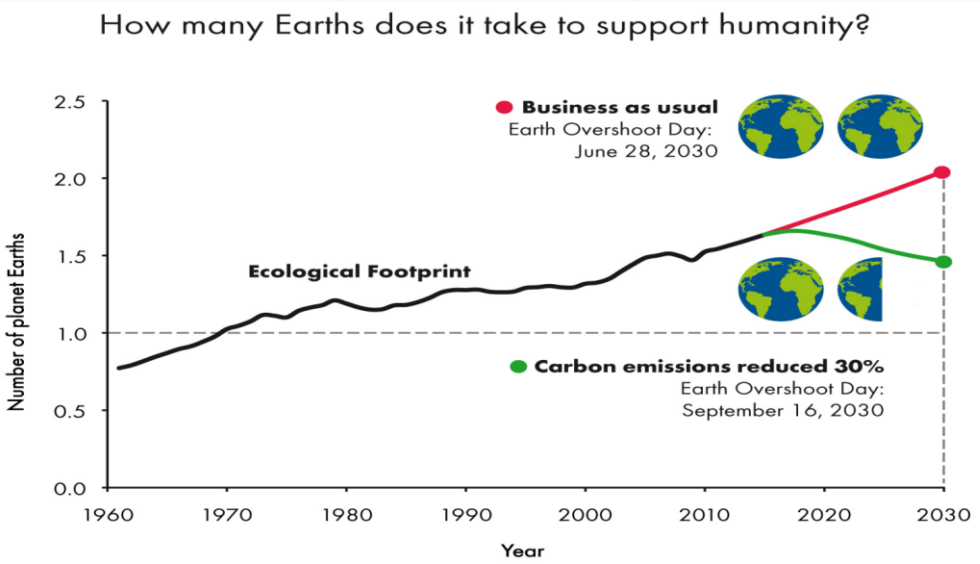
The main goal of the new model is to re-frame economic problems and set new goals.

Earth Overshoot Day

Last updated
17 Jul 2023

Climate | Nature | Trade and Environment | Science
SDG12 | SDG14 | SDG15

Earth Overshoot Day marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year. In 2023, it falls on 2 August.

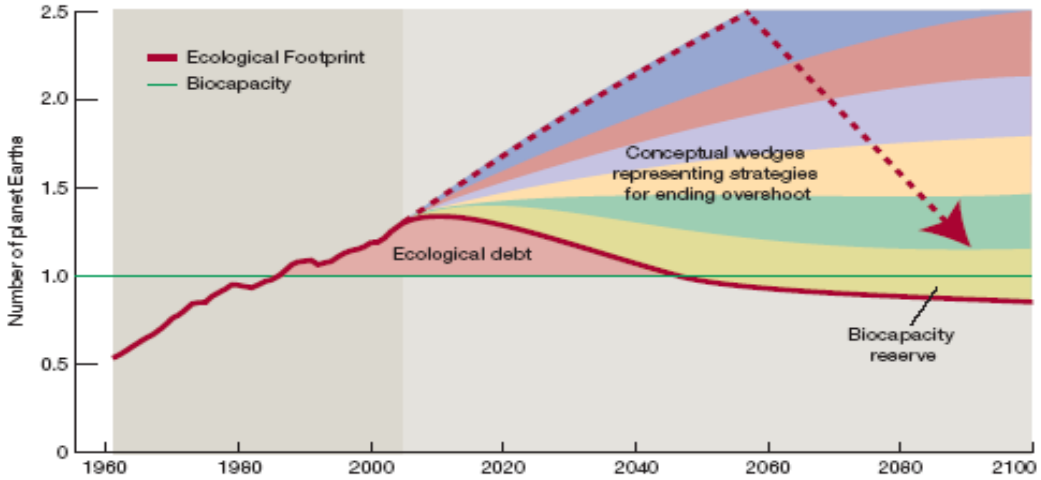


Sources: Earth Overshoot Day. Global Footprint Network.

How can ICTs help achieve environmentally sustainable development?

THE STABILISATION WEDGE THEORY

"Humanity already possesses the fundamental scientific, technical, and industrial know-how to solve the carbon and climate problem for the next half-century. A portfolio of technologies now exists to meet the world's energy needs over the next 50years and limit atmospheric CO2 to a trajectory that avoids a doubling of the preindustrial concentration"



Source: World Wide Fund for Nature WWF Living Planet Report 2008, - putting the world back on the path to long-term sustainability by 2050, Sustainability wedges and an end to overshoot - possession of the fundamental scientific, technical and industrial know-how

Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies
S. PACALA AND R. SOCOLOW, 2004

Who ?

Individual - YOU

Academia and Research Institutions, e.g. NTNU

Private Sector: ICT Companies and Startups

Governments and Policy Makers

NTNU SUSTAINABILITY

Strategic Research Area 2014–2023

NTNU's research on sustainable development of society includes environmental, economic and social aspects in the broadest sense.

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https://www.ntnu.edu/sustainability

Vision from the Faculty's main strategy

OUR VISION:

WE WILL MAKE THE FUTURE SMART, SAFE AND SUSTAINABLE

The Faculty of Information Technology and Electrical Engineering is 'the Faculty of the Future'. We help to generate knowledge for a better world by enabling a smart, safe and sustainable future for people, organizations and society. This will be achieved through our core activities: research, research-based education, innovation and dissemination.

The Faculty's vision and strategies will contribute to high-quality research and education, and ethical knowledge development. They constitute the basis of sustainable restructuring, competitiveness, welfare and life quality. They will make a significant contribution to ensuring that the adopted national and international goals for research and education policy are achieved, that Norway continues to be a good, safe place to live and that the UN Sustainable Development Goals are met.

Sustainability is well strategically rooted in the faculty's main strategy 2018-2025

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4 Goals – IE Sustainability strategy

Faculty of Information Technology and Electrical Engineering

1. IE will educate candidates who create smart, safe and sustainable development
2. IE aims to create opportunities for sustainability
3. IE will set the agenda for sustainability in our disciplines
4. IE will show sustainability in its own business

Goal 1: IE will educate candidates who create smart, safe and sustainable development

Sub-goals

1. *All study programmes at IE shall include sustainability in the learning outcome descriptions at programme and course level*
2. *All study programmes at IE must have a sustainability pitch*
3. ***All bachelor's and master's theses submitted at IE must reflect on the contribution of the thesis to sustainable development***

***The candidates we educate are our most important contribution to sustainable development**.*

*This goal puts students in the spotlight. NTNU has this high on the agenda, including through the work of the Future Technology Studies (FTS), which aims to ensure that "**NTNU's technology studies educate world-class creative candidates who can and will contribute to a better world and a sustainable future."***

TTM4175 - Introduction to Communication Technology and Digital Security

The two labs in this course cover several sustainability goals and targets. The lab on Ethical hacking provides an introduction to information security, which is directly connected to target 9.1 in SG9 (Industry, Innovation and Infrastructure) for reliable and resilient infrastructure. The second lab, Internet of things, covers enabling technology critical for several sustainability goals, and especially SG9 (Industry, Innovation and Infrastructure), SG14 (Life on Land) through sensor technology. It has a potential impact on SG12 (Responsible Consumption and Production) and SG11 (Sustainable Cities and Communities). We also discuss ethical dilemmas of IoT, like short-lived products and electronic waste, privacy concerns and safety issues.

The world needs a different kind of engineers!

Today's engineers should be able to:

- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Understand how their work interacts with society and the environment, locally and globally, in order to identify potential challenges, risks and impacts.
- Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives
- Understand and encourage stakeholder involvement.

The Barcelona Declaration (2004)
The 2nd International Conference of Engineering Education for Sustainable Development


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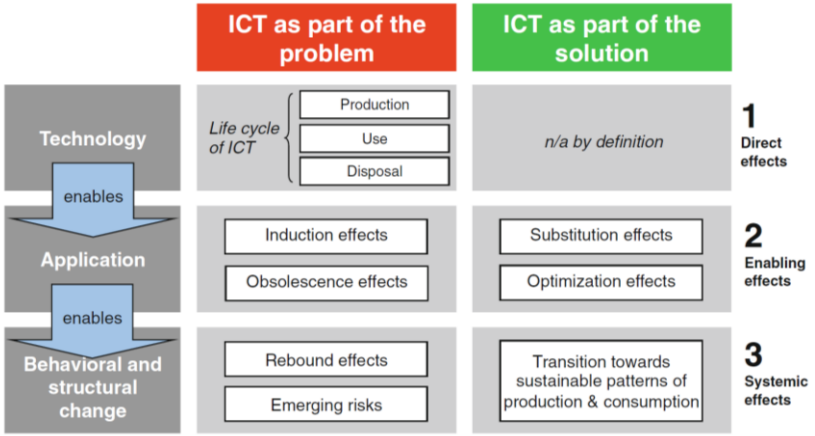
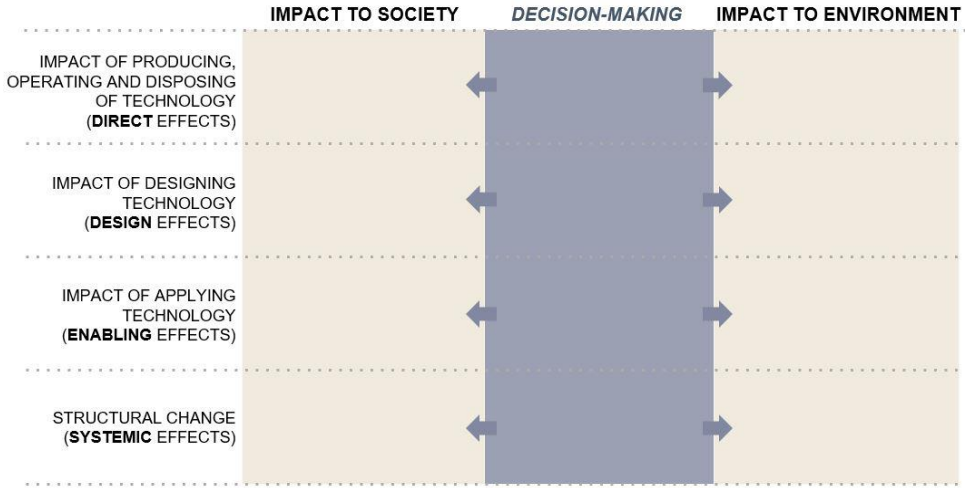
ICT as part of the problem
or solution

ICT & Sustainability





Lorenz M. Hilty

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Group work

“Sustainability is not just a goal - it's a continuous process.
You can create a balance where technology works for both people and the planet.”

Thank you!