



Transparent assessment of environmental impact of AI

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Head of Sustainability Standardization

11-12 December 2024

Environmental claims

No unified approach, yet

AI's carbon footprint is bigger than you think

Generating one image takes as much energy as fully charging your smartphone.

By Melissa Heikkilä

December 5, 2023

<https://www.technologyreview.com/2023/12/05/1084417/ais-carbon-footprint-is-bigger-than-you-think/>

AI's carbon footprint appears likely to be alarming

Monica de Bolle (PIIE)

October 20, 2024 3:00 PM

<https://www.piie.com/blogs/realtime-economics/2024/ais-carbon-footprint-appears-likely-be-alarming>

DECEMBER 7, 2023 | 5 MIN READ

AI's Climate Impact Goes beyond Its Emissions

To understand how AI is contributing to climate change, look at the way it's being used

BY JUDE COLEMAN

<https://www.scientificamerican.com/article/ais-climate-impact-goes-beyond-its-emissions/>

NATIONAL

Three Mile Island nuclear plant will reopen to power Microsoft data centers

SEPTEMBER 20, 2024 · 1:40 PM ET

By C Mandler

<https://www.npr.org/2024/09/20/nx-s1-5120581/three-mile-island-nuclear-power-plant-microsoft-ai>

Standardized methodology needed for environmental impact

Initiatives started



ITU-T work item L.ClimAI

Guidelines for Assessing the Impact of Artificial Intelligence on Greenhouse gas emissions

In ITU-T SG5 Q9

https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=19564

New work item initiated in June 2024
Target completion in 2026

Supporting members

China Unicom
China Telecom
State Grid Corporation of China
ZTE Corporation
Nokia corporation
Orange
Colombia
ARCEP

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Standardization scope of ITU-T L.ClimAI

Guidelines for Assessing the Impact of AI on Greenhouse gas emissions

Holistic framework for evaluating the GHG emissions of AI, covering **direct and indirect impacts**, **assessment**, and **mitigation** strategies



Based on **ITU-T L.1410** (LCA) and **ITU-T L.1480** (enabling effect) applying the methods for AI systems



Comparative assessment

- 1) AI technology compared to not using AI or
- 2) comparing impact of two AI systems



Full life cycle of AI systems



L.1410 "Methodology for environmental life cycle assessments of information and communication technology goods, networks and services"

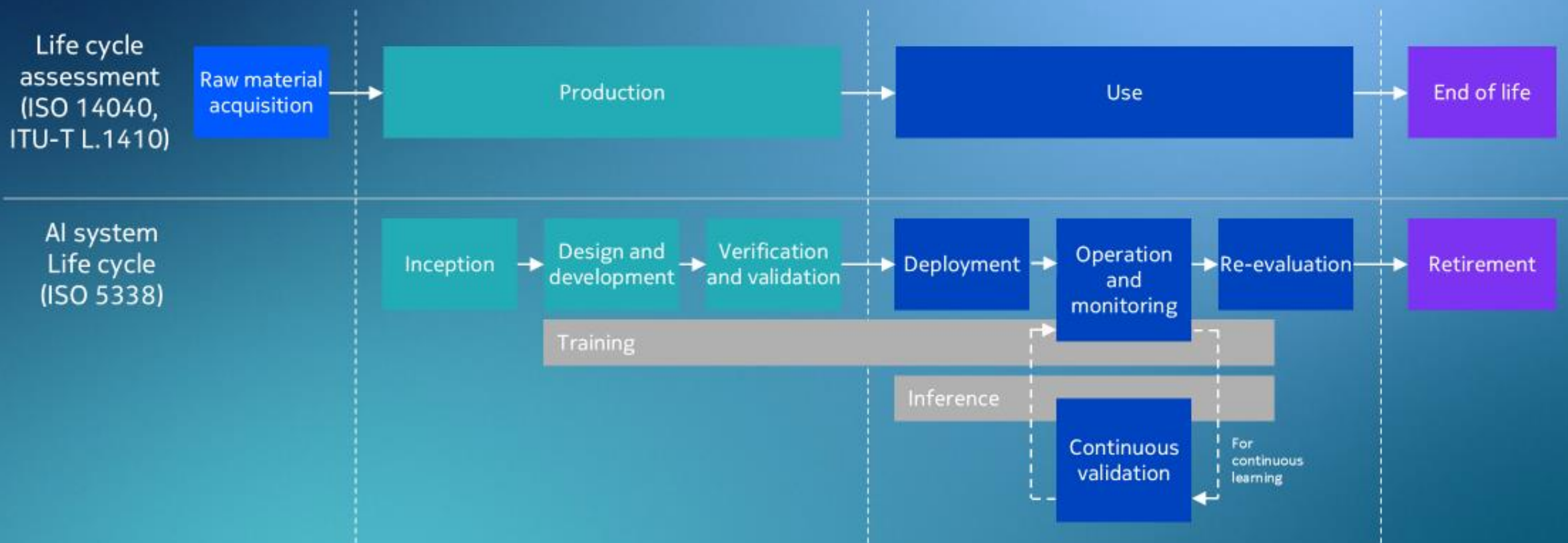
L.1480 "Enabling the Net Zero transition: Assessing how the use of information and communication technology solutions impact greenhouse gas emissions of other sectors"

Applying existing LCA methodology for AI systems



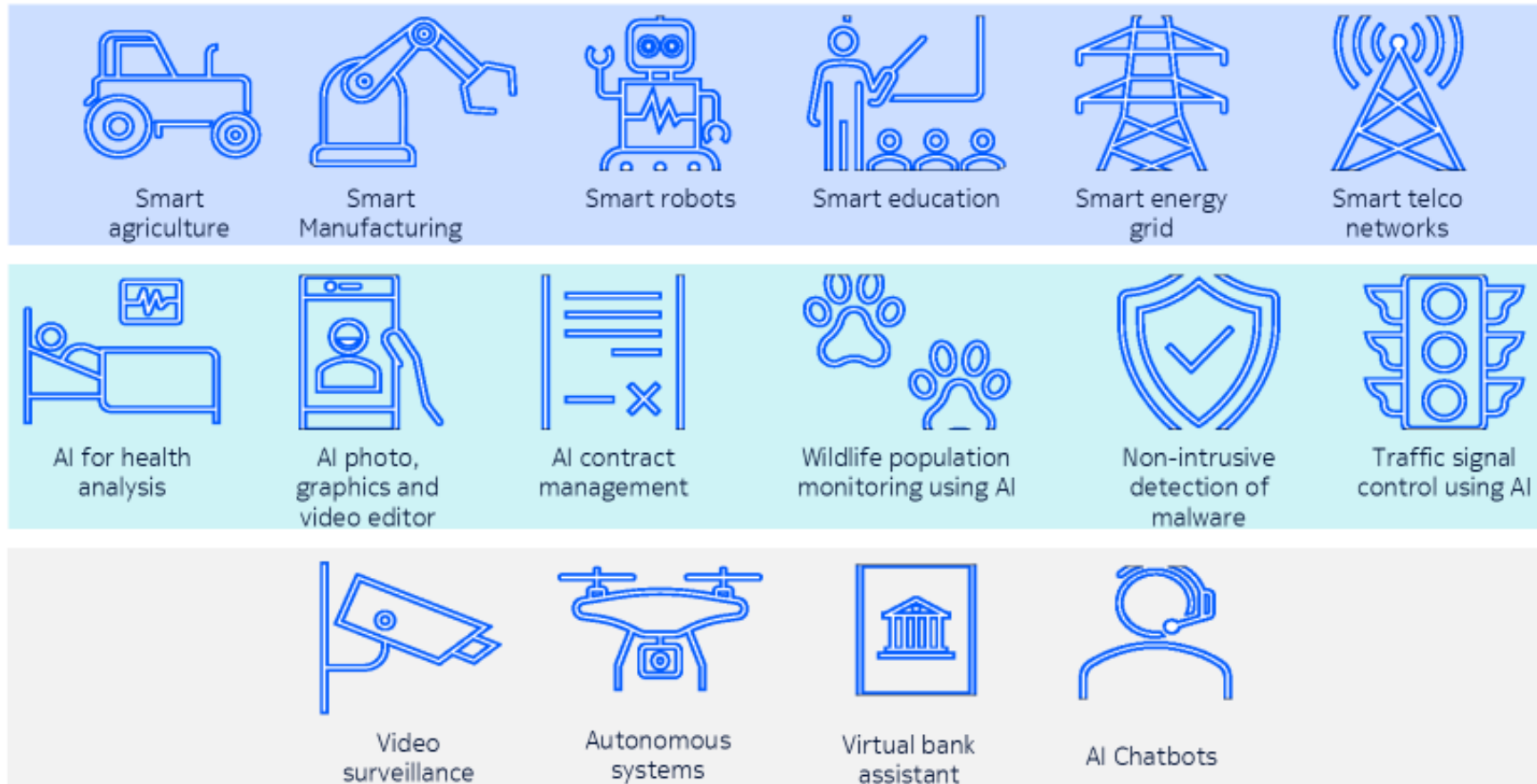
The environmental sustainability impact of AI

Mapping from Nokia

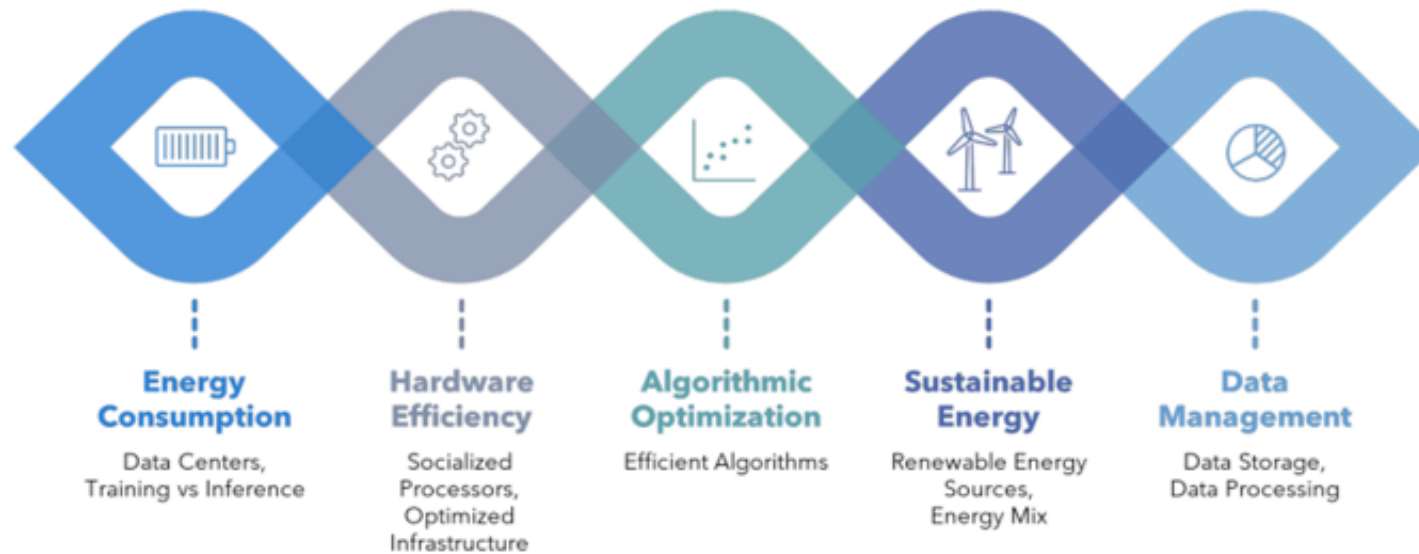


Source: Figure 4 in Nokia WP 'A transparent and standards-based way to assess the environmental impact of AI systems', <https://onestore.nokia.com/asset/214115>

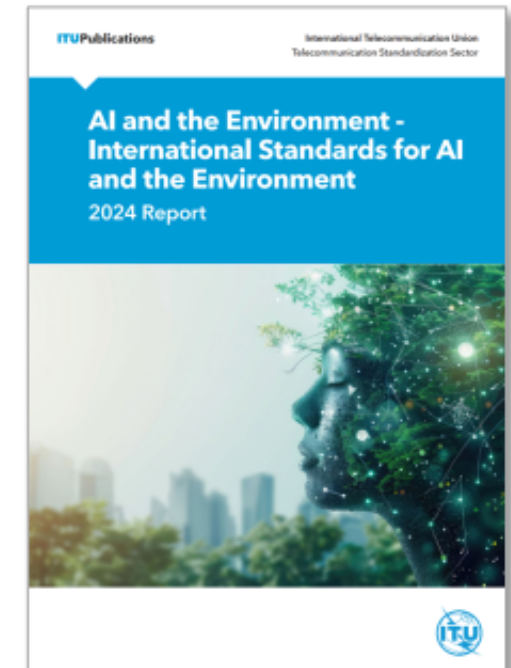
Using AI in manifold use cases



Targeted and tailored actions to reduce environmental impact



Source: ITU-T 2024 Report, AI and the Environment - International Standards for AI and the Environment,
https://www.itu.int/dms_pub/itu-t/opb/env/T-ENV-ENV-2024-1-PDF-E.pdf



Take away

Standard methodology under development

Building on existing methods –
LCA based approach

General methodology for AI specific characteristics

NOKIA