Life Cycle Assessment
Big picture and case study

Janne Rantanen | 2019 | Confidential
Challenges in life cycle assessment

1. Calculation are made only in too detailed level
2. Lack of standards means that we can’t compare results of different calculation well
3. We have carbon neutrality goals but it’s difficult to make realistic road-map how we reach those goals
4. The amount of data related to life cycle assessment is huge

→ We need tools to handle the data and we need to build a big picture to reach our goals
THE BIG PICTURE

Calculation tool (cost / emissions)

Yearly new investments

Current amount of maintained assets (costs / emissions)

Yearly maintenance (cost / emissions) caused by new investments

Asset management tool

Resource requirements of maintained assets

- = investment
- = maintenance

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Aiming towards carbon neutrality

Co2

Assessment of current situation

Simulating effects of improvements

Guiding projects through goals

Auditing planning

Current solution

Improved solution

Target

Plan

-5%  -10%  -15%  -20%  -25%  -30%  -35%  -40%  -45%  -50%

2020  2022  2024  2026  2028  2030  2032  2034  2036  2038

-5%  -10%  -15%  -20%  -25%  -30%  -35%  -40%  -45%  -50%
COMBINING COSTS AND EMISSIONS

Current amount of maintained assests (costs / emissions)

- e.g. bridge (modeled from stuff below)
  - Inputs that cause most CO2 emissions
  - Inputs have cost and emission information

New models for calculation tools

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Case study: Emissions of bridges (200)

1. We build LC-model for expected maintenance tasks for bridges

2. We calculated amount of maintenance inputs for 200 bridges and searched three most important

3. We simulated improved solution for concrete and machine hours

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Concrete 66%
Machine hours 15 %
Steel 8 %

Improved concrete  -15% emissions
Bio diesel -10% emissions
Case study: Emissions of bridges (200)

Combined emissions of bridges (200)

- Emissions
- Improved emissions

kgCO2e

Vuosi

2020 2030 2040 2050 2060 2070 2080

1.15 M Kg

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From asset management to project management

1. From asset management level we can forecast the effects of different improvements we make in separate areas and build strategy for reaching carbon neutrality goals.

2. With project management tools (cost calculation) we can guide our projects so that the asset level strategy is followed through.

3. By Combining costs and emissions of infra projects we also give price tag for our plans to reduce carbon emissions.
To summarize

1. Life cycle costing tools are required for making asset level strategies
2. Asset level sets goals for project level
3. Project level guides projects towards goals
4. Standards are required – without them we have separate uncomparable data
Thank you

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