



**DEVELOPMENT OF LCABYG FOR THE DANISH
BUILDING SECTOR
DRIVERS FOR THE DEVELOPMENT AND APPLICATION
OF THE TOOL**

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Why, how, when?

2014

The Danish Government:
Political strategy for buildings
with
Vision for a Voluntary Sustainability
Class in the Building Code



2015

National LCA-tool LCAbyg launched
in April 2015
+
Several publications

Introduction
to LCA of Buildings

2016



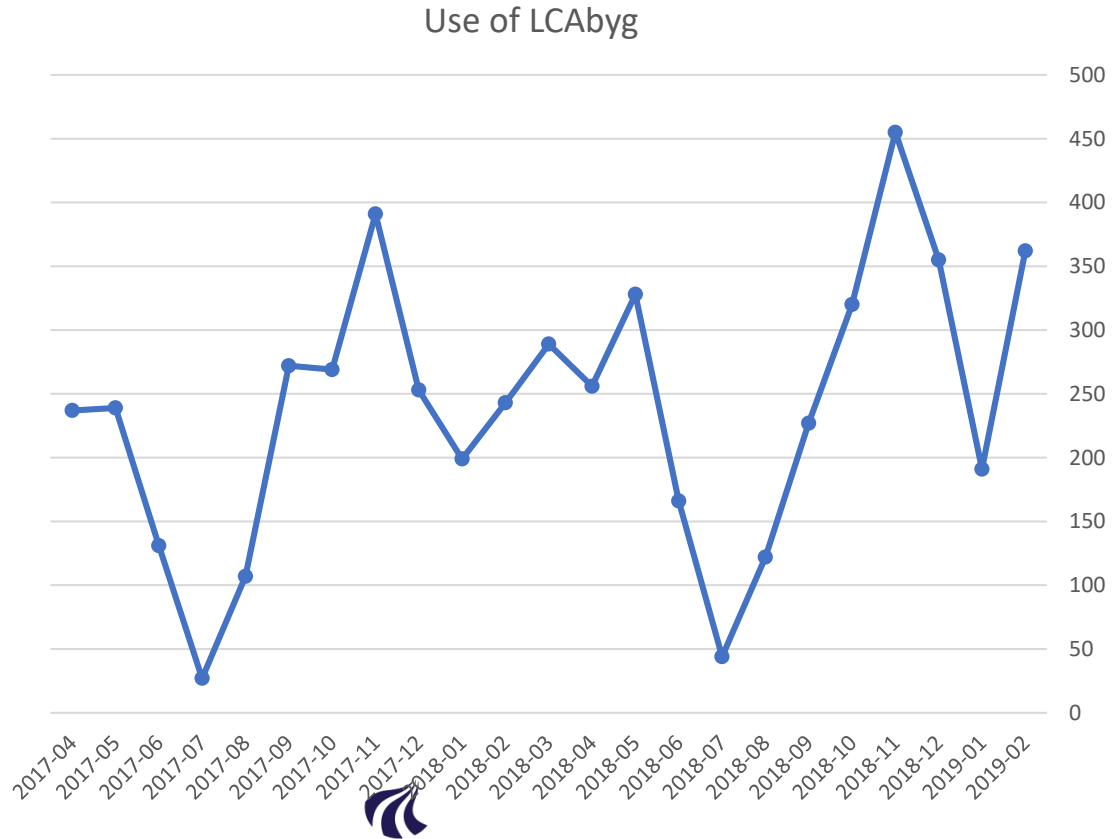
In brief

- Developed by The Danish Building Research Institute for the Danish Transport, Construction and Housing Authority
- National freely available tool developed for the Danish building sector
- First version launched in April 2015
- New beta version in January 2019 with focus on early design stages
- Over 3000 users, about 300-500 users each month



It is being used

About 3000
registered users in
total



CONDITIONS

Short time to develop a robust tool for
different users in Denmark



FOKUS in the tool development:

- Transparency
- Understand
- Learn
- Improve



Quick overview of quantities and understand the massflow

Quantity
Here you can see the project by weight and quantity

	Description	Filled in quantity	Calculated quantity	Weight	Service life
▲ Building components	Total building	-	-	3.481.069 kg	-
▷ Building base	Main group	-	-	80.802 kg	-
▷ Primary building components	Main group	-	-	3.368.962 kg	-
▷ Completions	Main group	-	-	30.863 kg	-
▷ Installations	Main group	-	-	442 kg	-

Numbers in green are not added up in the total building sum (demolition)

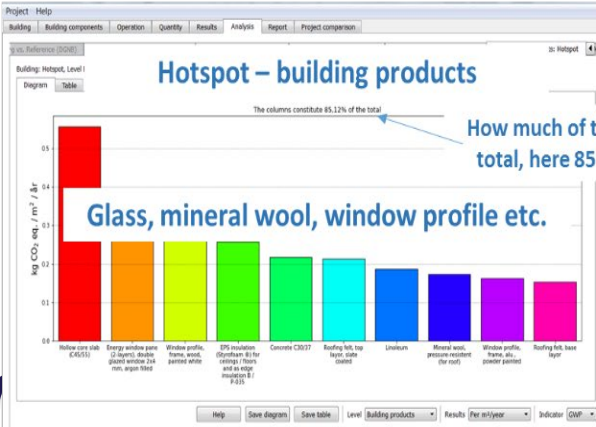
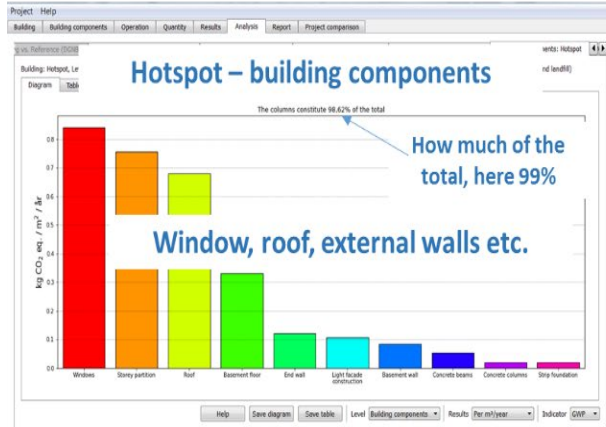
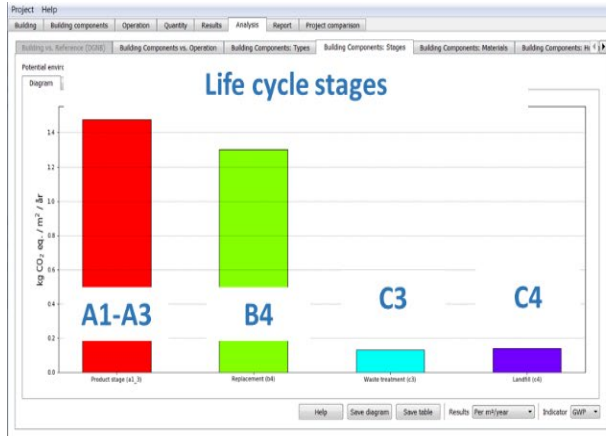
Quantity
Here you can see the project by weight and quantity

	Description	Filled in quantity	Calculated quantity	Weight	Service life
▲ Building components	Total building	-	-	3.481.069 kg	-
▲ Building base	Main group	-	-	80.802 kg	-
▲ Foundation	Type	-	-	80.802 kg	-
▲ Strip foundation	Building component	134 m	-	80.802 kg	-
▲ Strip foundation (500 x 50...	Construction	-	-	80.802 kg	-
Concrete C30/37	Building product	0,25 m ³ /m	33,5 m ³	80.400 kg	120 år
Steel, reinforcing steel	Building product	3 kg/m	402 kg	402 kg	120 år
▲ Primary building components	Main group	-	-	3.368.962 kg	-
▲ Exterior wall	Type	-	-	539.876 kg	-
▲ Basement wall	Building component	330 m ²	-	213.051 kg	-
▲ Basement wall w/ EPS insu...	Construction	-	-	213.051 kg	-
EPS insulation (Styrofoa...	Building product	0,3 m ³ /m ²	99 m ³	2.247 kg	80 år
Bitumen for waterproof...	Building product	0,5 kg/m ²	165 kg	165 kg	80 år
Concrete C30/37	Building product	0,26 m ³ /m ²	85,8 m ³	205.920 kg	120 år
Steel, reinforcing steel	Building product	14,3 kg/m ²	4.719 kg	4.719 kg	120 år
▲ End wall	Building component	515 m ²	-	291.471 kg	-
▲ Exterior wall w/ mineral w...	Construction	-	-	291.471 kg	-
Bricks, facing	Building product	0,09 m ³ /m ²	45,32 m ³	81.576 kg	120 år
Mortar masonry mortac...	Building product	0,02 m ³ /m ²	10,3 m ³	15.450 kg	120 år
Mineral wool, facade sy...	Building product	0,25 m ³ /m ²	128,75 m ³	5.955 kg	80 år
Concrete C30/37	Building product	0,15 m ³ /m ²	77,25 m ³	185.400 kg	120 år
Steel, reinforcing steel	Building product	6 kg/m ²	3.090 kg	3.090 kg	120 år
▲ Light facade construction	Building component	624 m ²	-	35.354 kg	-
▲ Light facade construction	Construction	-	-	35.354 kg	-

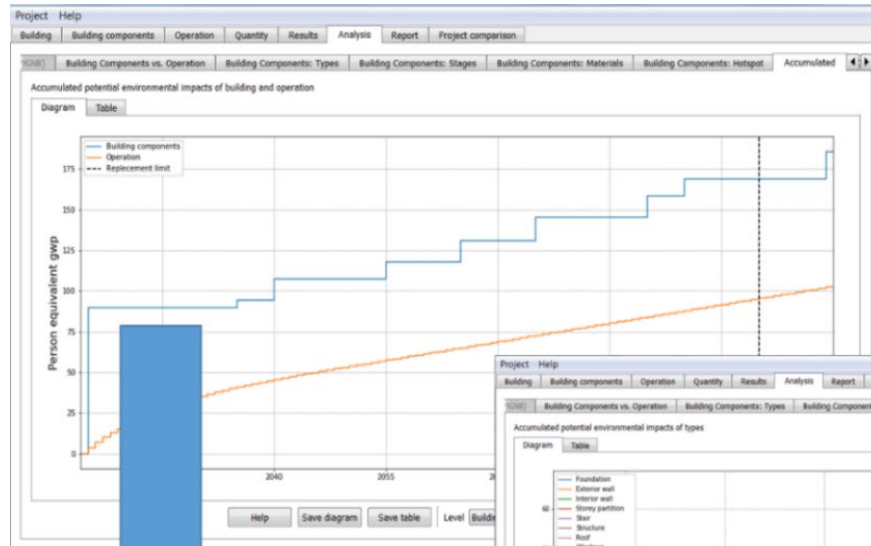
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Help Hide all Show all

Analysis with pre-defined figures

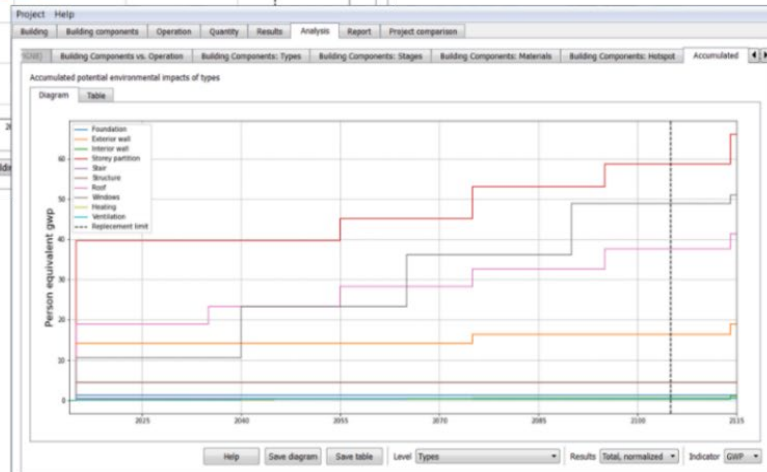


Last but not least: Understanding **WHEN**, **HOW MUCH** and **WHY**

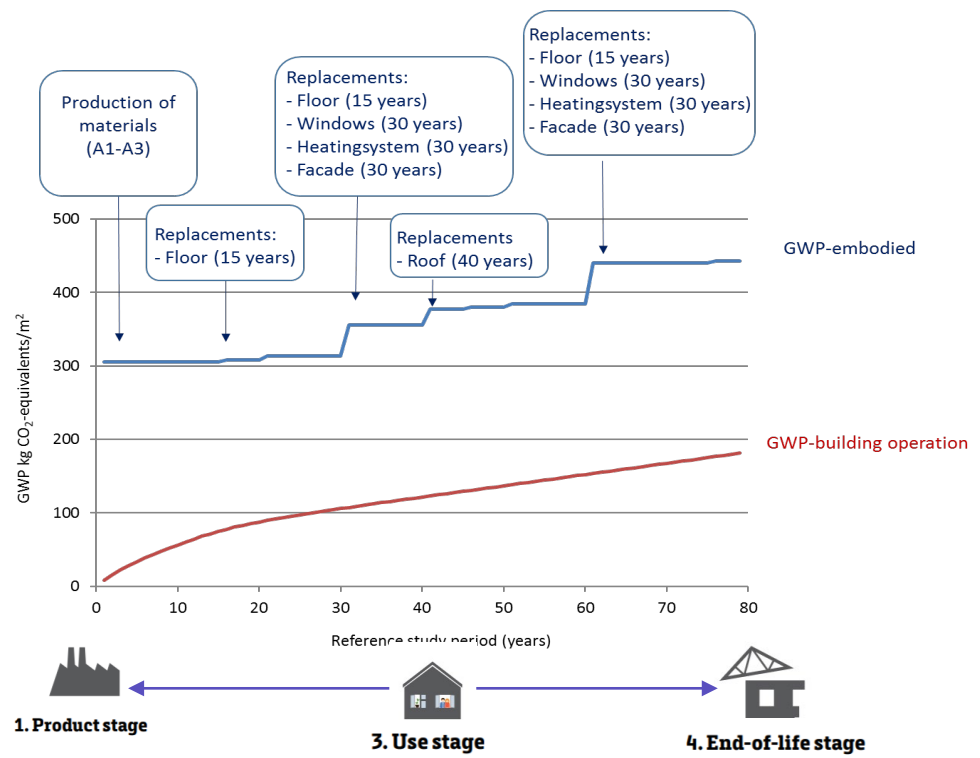
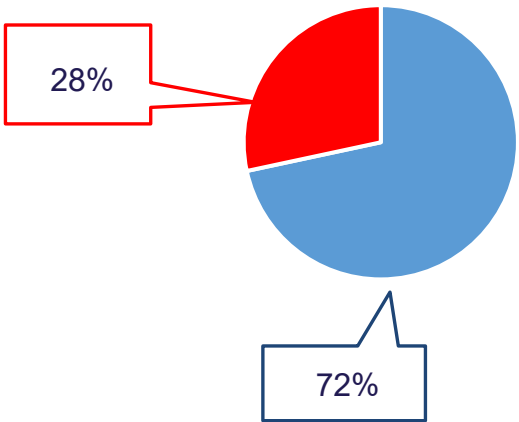


Embodied

Operational energy



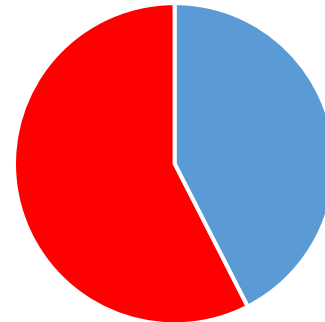
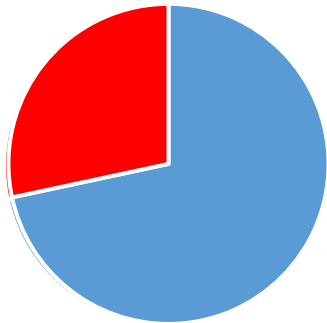
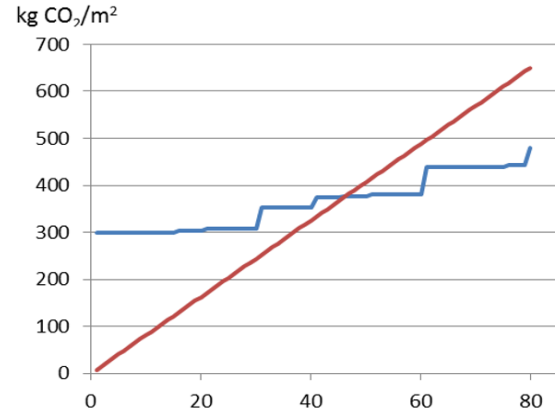
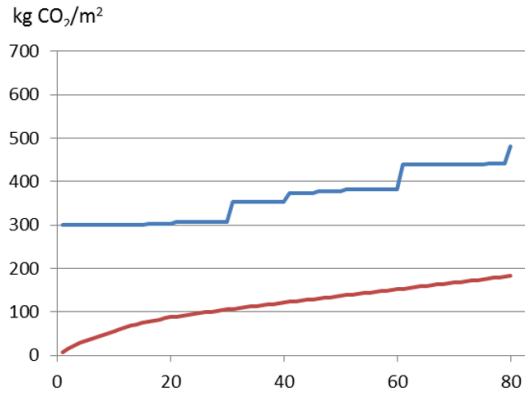
Whole life carbon assessment for an office building – an example



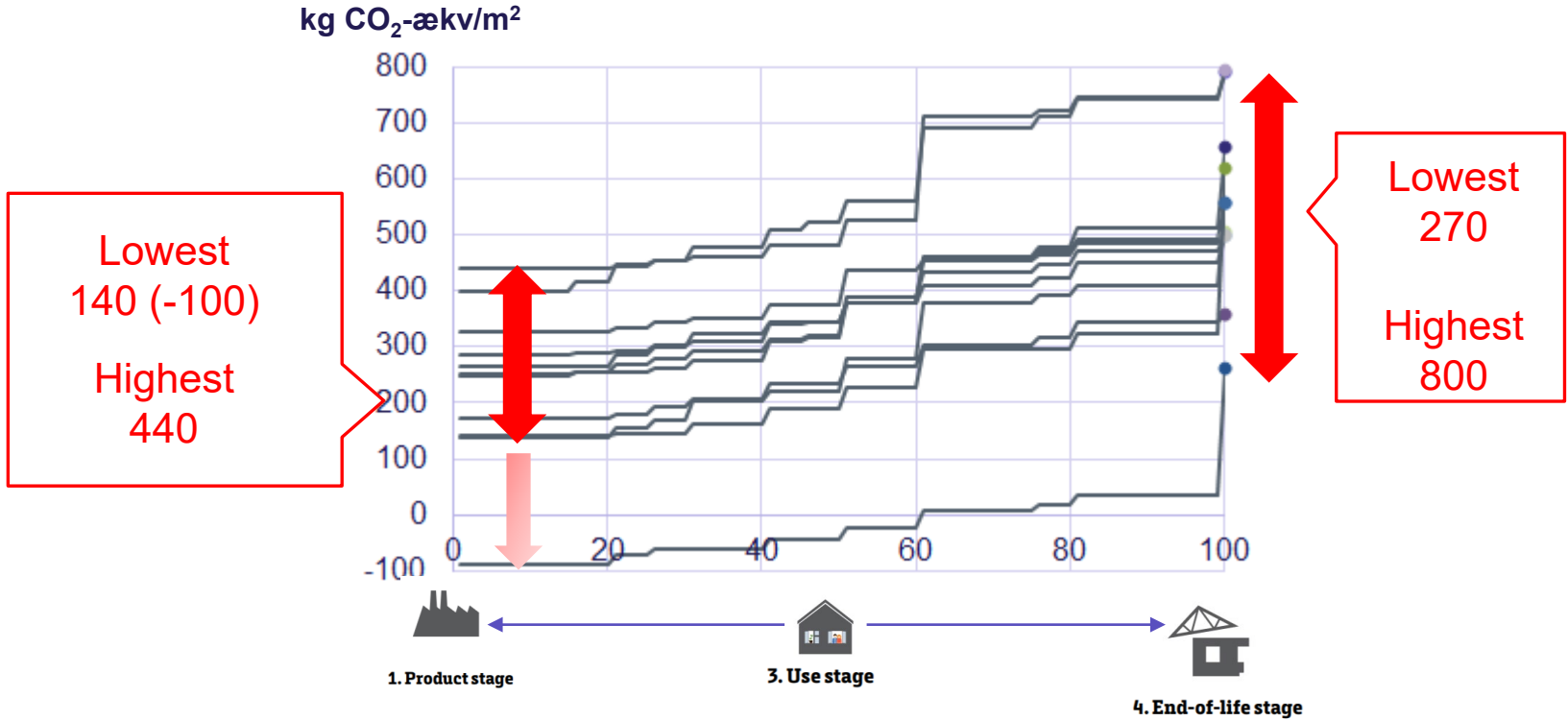
Not regulated

Regulated

Consequences of using static versus forecasting - and how results are presented!



There is a large potential to reduce the embodied impacts



Our goals have been to:

- Increase building designer's **awareness**
- Let them **understand** where, in the building life cycle, reductions can be achieved
- Significant to focus on **simplifying** the process
- Finding ways of **communicating complex LCA results** to the users
- Perform **comparisons** of different construction solutions and material uses within the tool.
- Developing **predefined visualization** of results that were believed to qualify the designer to identify **hotspots** and to **understand** and mitigate the major impacts throughout the building's life cycle.
- Encourage the user to **shuffle around** between the **numerical results** and the **figures** in order to understand

