



Circularity in asphalt for lower CO2 emissions

ASTA ZERO
Hålleröd

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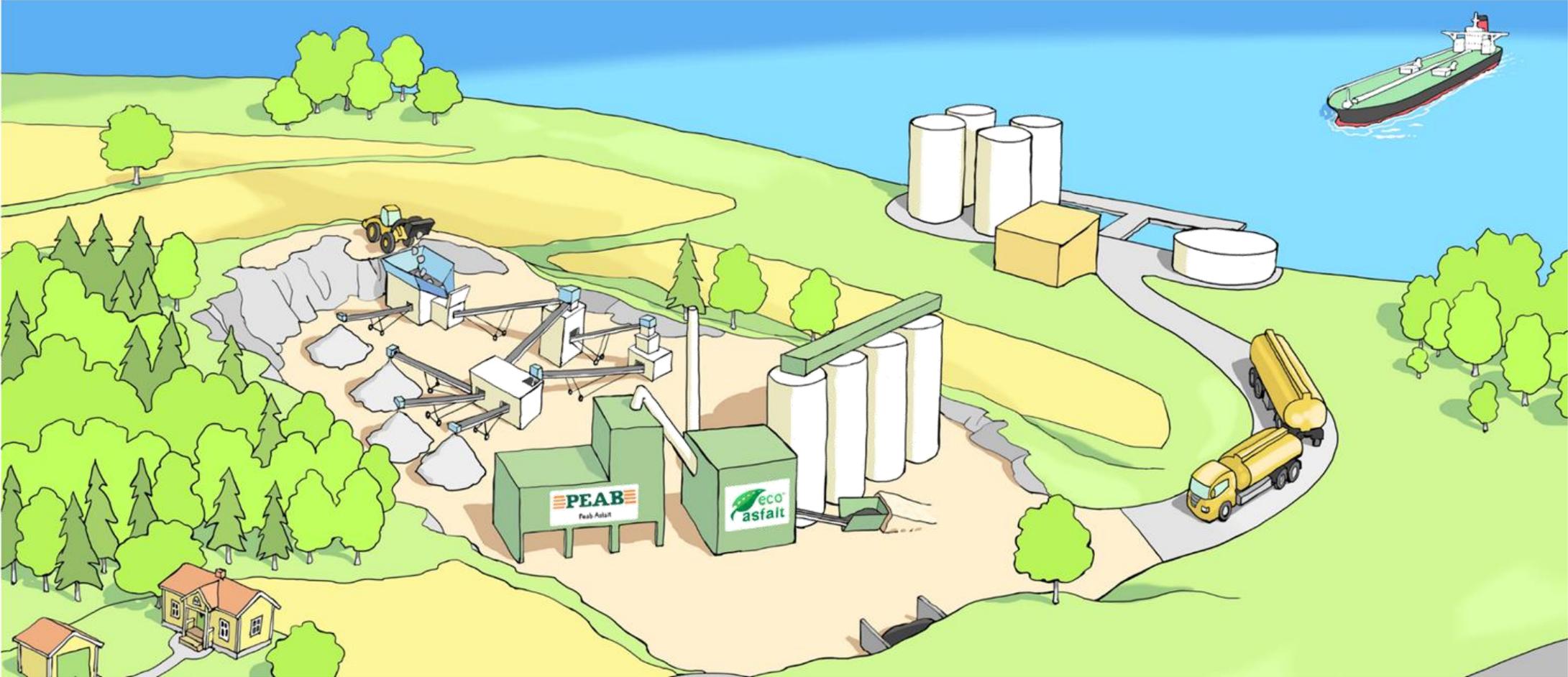
Outline of presentation

- Manufacturing of asphalt (climate impact)
- Example of industry solutions
- Reclaimed Asphalt, RAP
- Conclusions

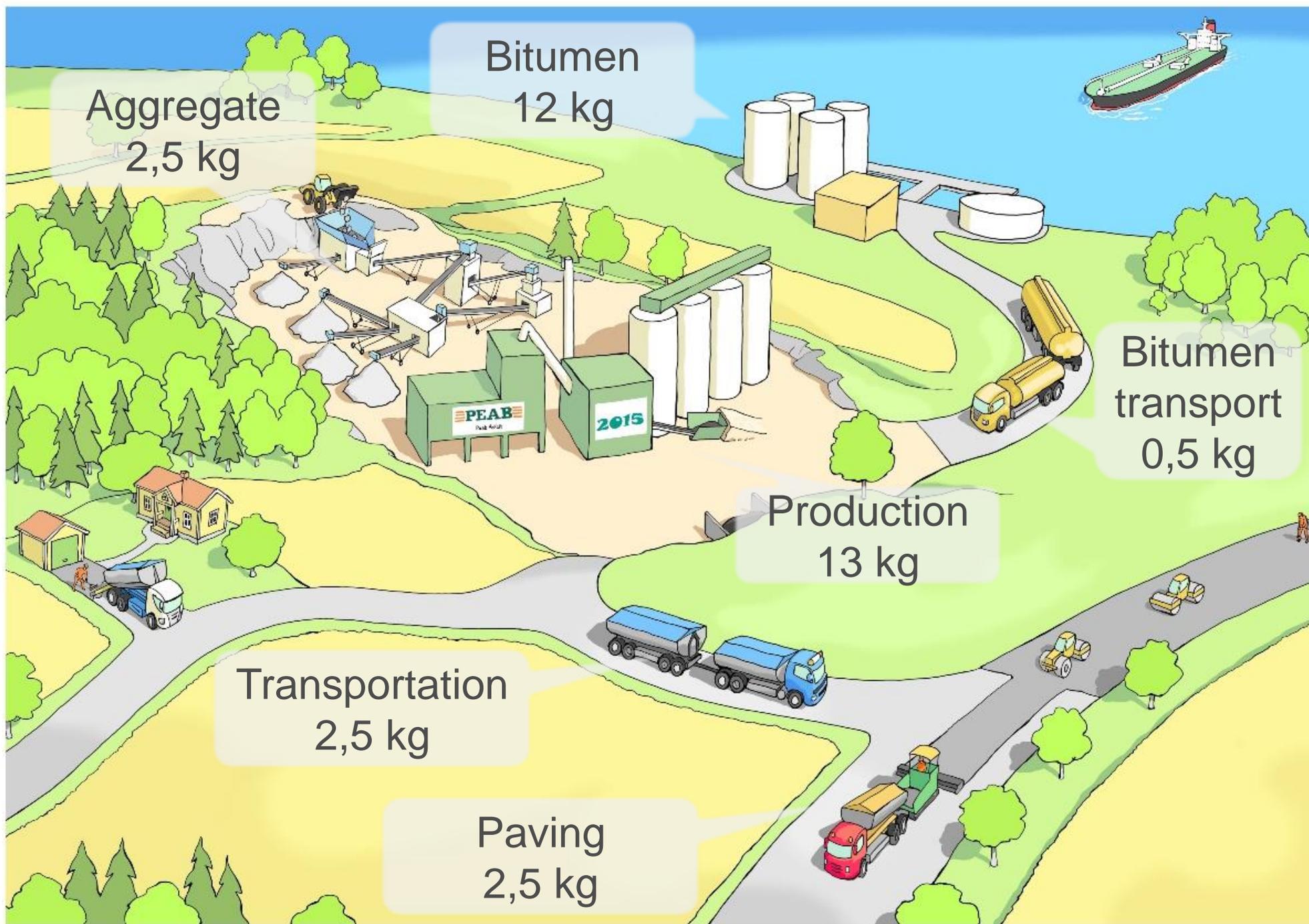
The Asphalt Production Process

Asphalt production

Manufacturing process of asphalt



”Cradle to gate” – all impact from sources, process, transportation etc to manufacturing gate.



Aggregate
2,5 kg

Bitumen
12 kg

Bitumen
transport
0,5 kg

Production
13 kg

Transportation
2,5 kg

Paving
2,5 kg

GWP* for a SMA 16 mm 6.2% 70/100 in Sweden

All numers in kg
CO₂e/metric ton

In total:
33 kg CO₂e/ton

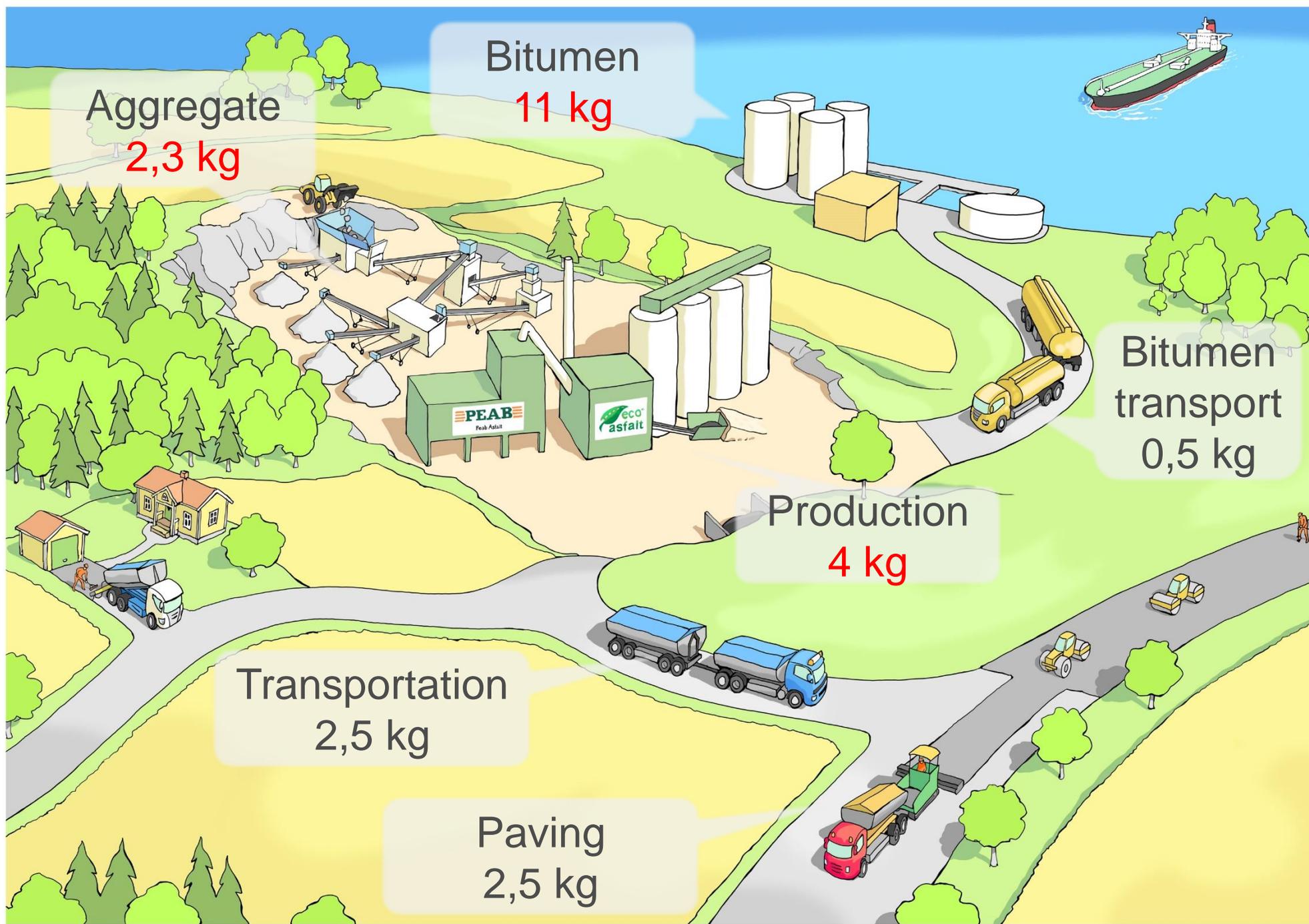
*Global Warming Potential



Carbon reduction investment aid (Carbon Step)

- A Swedish government initiative to speed up the process towards net-zero GHG.
- Local investments – measurable results
- Municipalities, regions, business and organizations can apply
- 8.4 billion SEK 2015-2023 (approx. 1.7 billion for 2018, 2.84 billion SEK already used since 2015)
- Rules exist, clearly defined.
- Average aid 44% of added investment cost to reduce CO₂, so far.





Aggregate
2,3 kg

Bitumen
11 kg

Bitumen
transport
0,5 kg

Production
4 kg

Transportation
2,5 kg

Paving
2,5 kg

**GWP* for a
SMA 16 mm
6.2% 70/100
in Sweden**

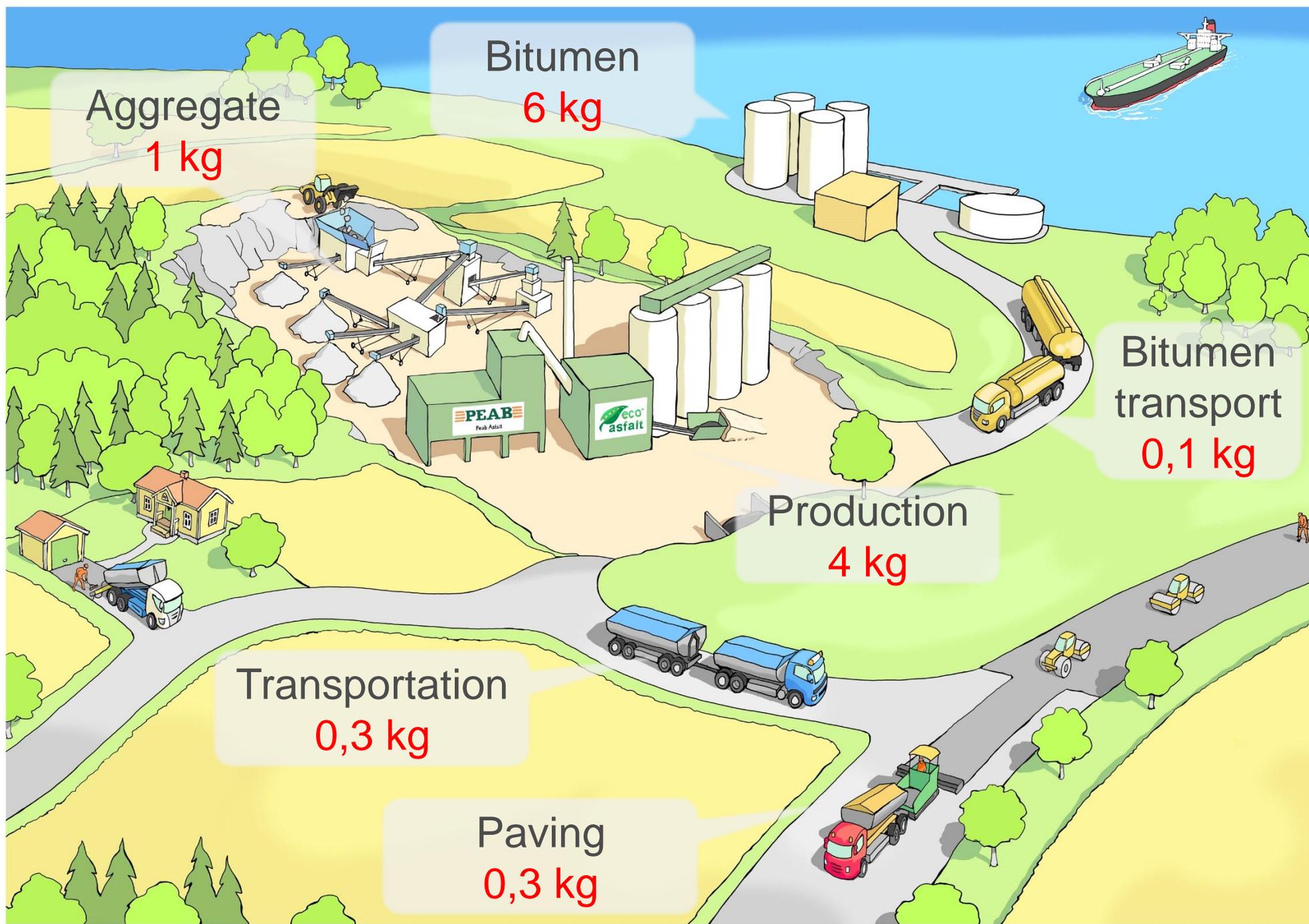
All numers in kg
CO₂e/metric ton

In total:
22,8 kg CO₂e/ton



*Global Warming Potential





Aggregate
1 kg

Bitumen
6 kg

Bitumen
transport
0,1 kg

Production
4 kg

Transportation
0,3 kg

Paving
0,3 kg

**GWP* for a
SMA 16 mm
6.2% 70/100
in Sweden**

All numers in kg
CO₂e/metric ton

In total:
11,7 kg CO₂e/ton

**”Best case
2020”**

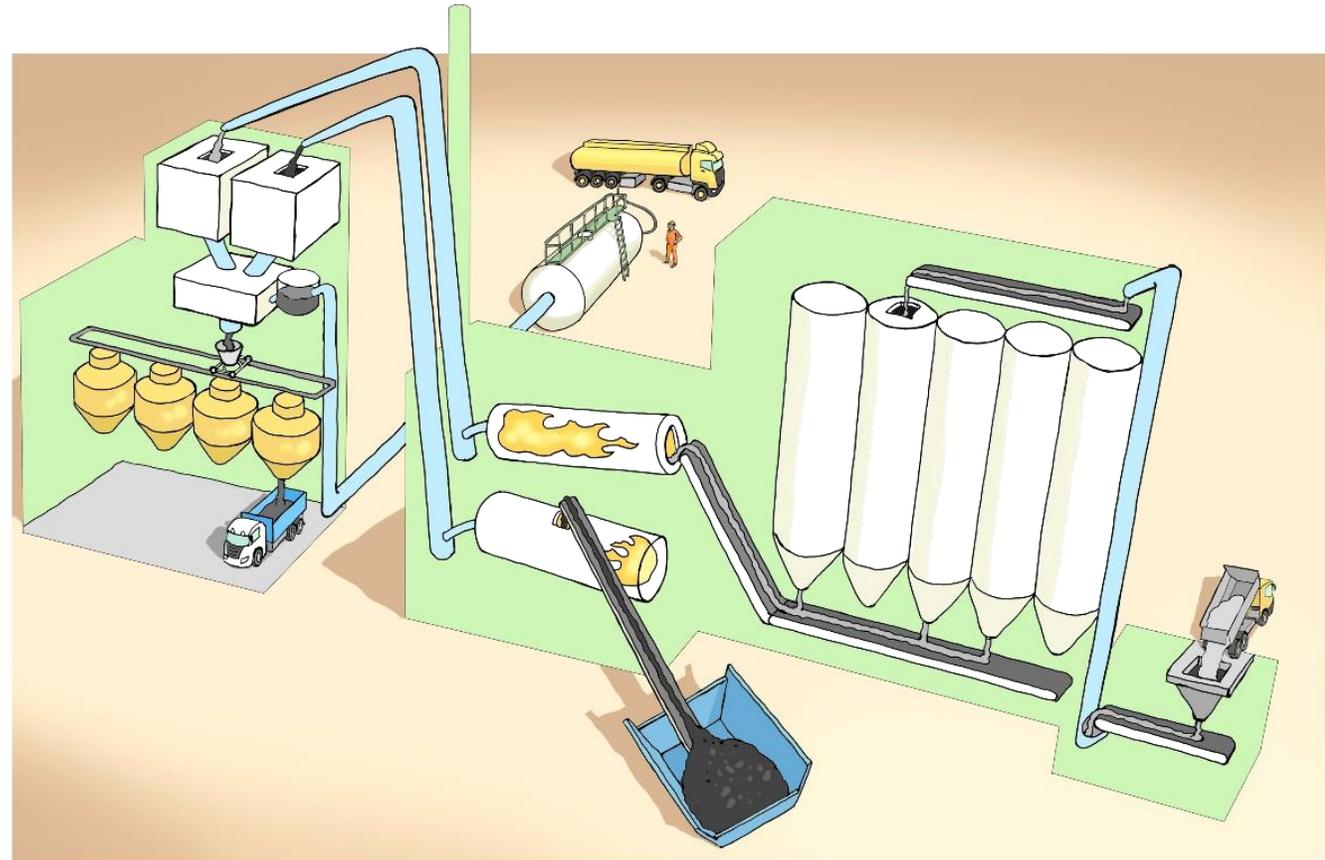
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The dominant energy consumer in an asphalt plant, is the drying and heating process.

In Peab Asfalt's ECO-Asfalt, the traditional burner oil is replaced with a heavy vegetable based bio-oil.

Other contractors in Sweden have used either wood pellets or light bio-oil.

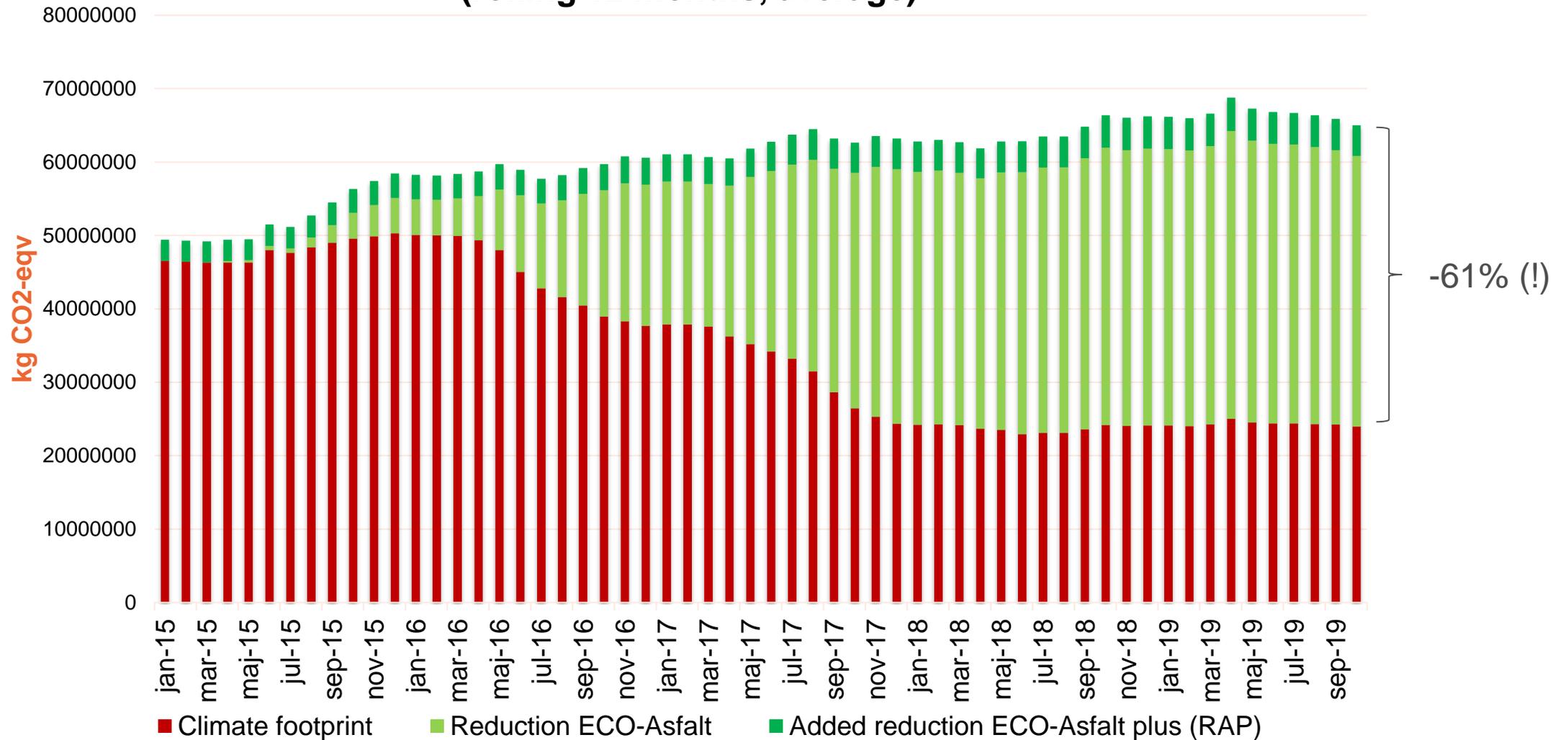


RAP – the greatest source of reused material for asphalt!

- The Industry needs to be careful of what to put into asphalt pavements
 - To ensure future reuse
 - Not harm the environment or workers
- New and recycled materials, additives etc has to be carefully designed with special consideration to workers health, safety, and future reuse of the material.
- Important to pay attention to technical lifetime and examine all possible aspects. Shortened life would be an issue!

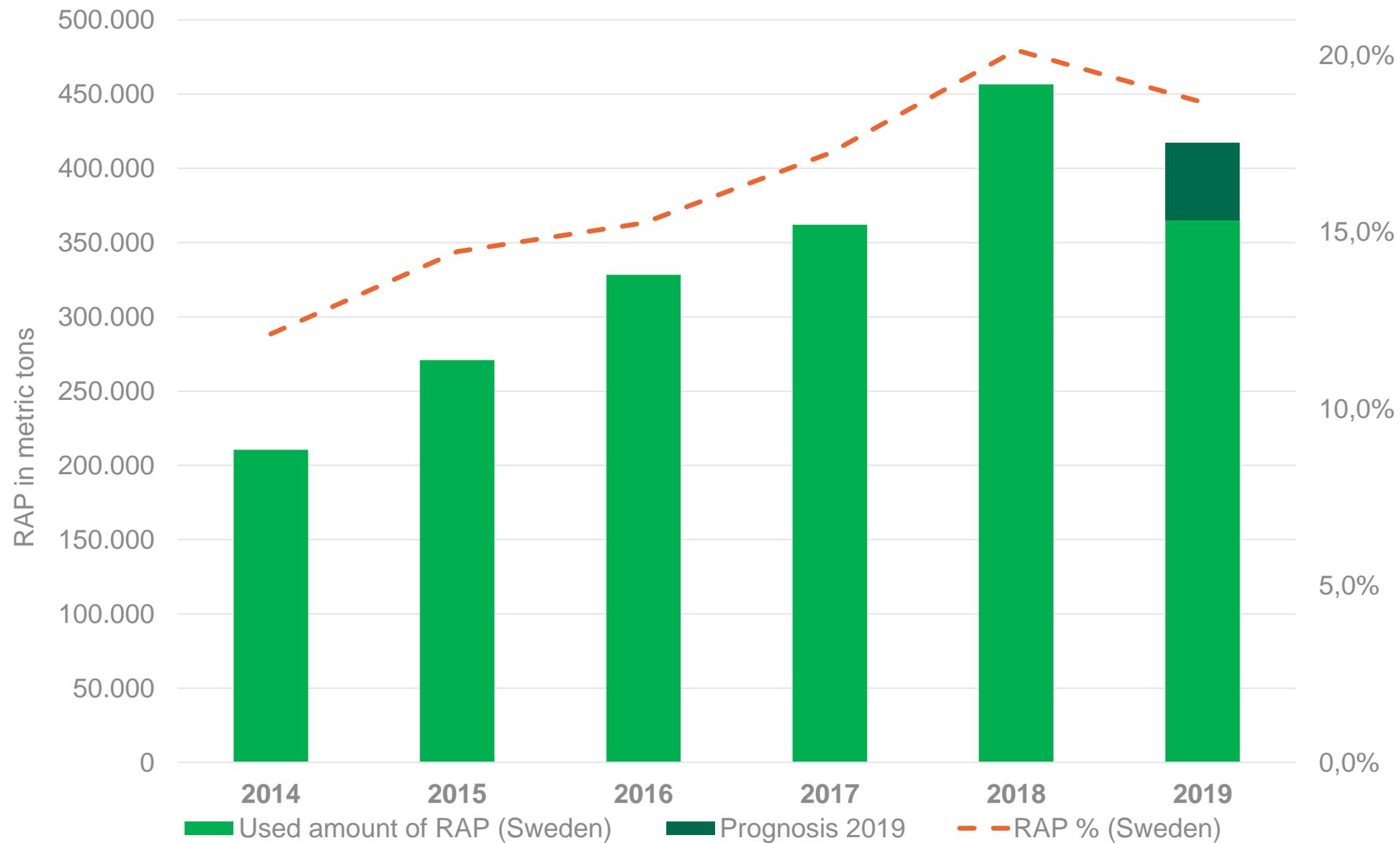
Climate footprint

Peab Asphalt, climate footprint from asphalt production* in Sweden
(rolling 12 months, average)



*Mobile asphalt plants excluded

Amount of recycled asphalt used by Peab Asfalt in Sweden



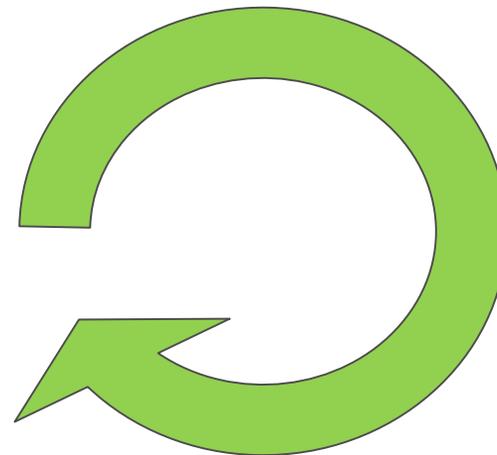
Identified issues in legislation

(personal remark)

- The EU (recycling of) waste directive, i.e. with end-of-waste criteria, in order to productify waste products, encounter problems in many cases national regulations and limitations of administrations.
- Waste usually have a restricted handling, making it hard to store and reuse RAP.
- In order to achieve true circularity, we need a shortcut process for reuse of materials – they are already designed for it!
- The system already have a control function in place to cut out contaminated old asphalt.



Reuse



Recycling

Sustainable conclusions

- Upgrade equipment and machinery to use sustainable fuels.
- Use RAP to reuse important resources and minimize natural resources.
- Address the responsible use of additives and recycled material.
- Develop EPD:s so the road owner can find trust in environmental performance.
- Address the need of environmentally interested buyers in order to make the great industry progress!
- **We need small circles in the circular economy!**
- Funding is important, to make change happen and speed up the progress!

**No one can do everything,
but everyone can do something!**

Thank you for listening!