

Using carbon balance to evaluate CO2 impact of reduction of waste

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Waste management: 1st stop for public awareness about SD

- Domestic waste management = daily actions, one of the easier entrances to personal commitment to sustainable development
- → 2000's: Home sorting of glass, paper, packaging...= most ecological gesture : « Recycle »
- First Perception by inhabitants of SD
- Asset for improving water or air quality

Waste prevention is an amplifier

- Waste prevention in France = complementary to recycling, not set against it.
- Recycling \neq reason for tuning down waste prevention actions
e.g. having a packaging bin in the street is not a reason to agree with packaging growth
- Recycling \neq waste prevention!

Waste prevention is a win, win policy

No-waste is generally also no new product

Repairing appliances or buying a second hand bike means not buying a new one and not throwing the old one away

Eating food on time (fresh fruits, preserves, or cans) and buying the right quantity means less rubbish and fewer goods to produce

Fewer new products, fewer goods also mean fewer natural resources, less oil, less pollution, less transport, less fuel ... and fewer CO2 emissions

All this is money saving for households and companies

New jobs are created, (balancing jobs lost in non-production and sale of products, if)

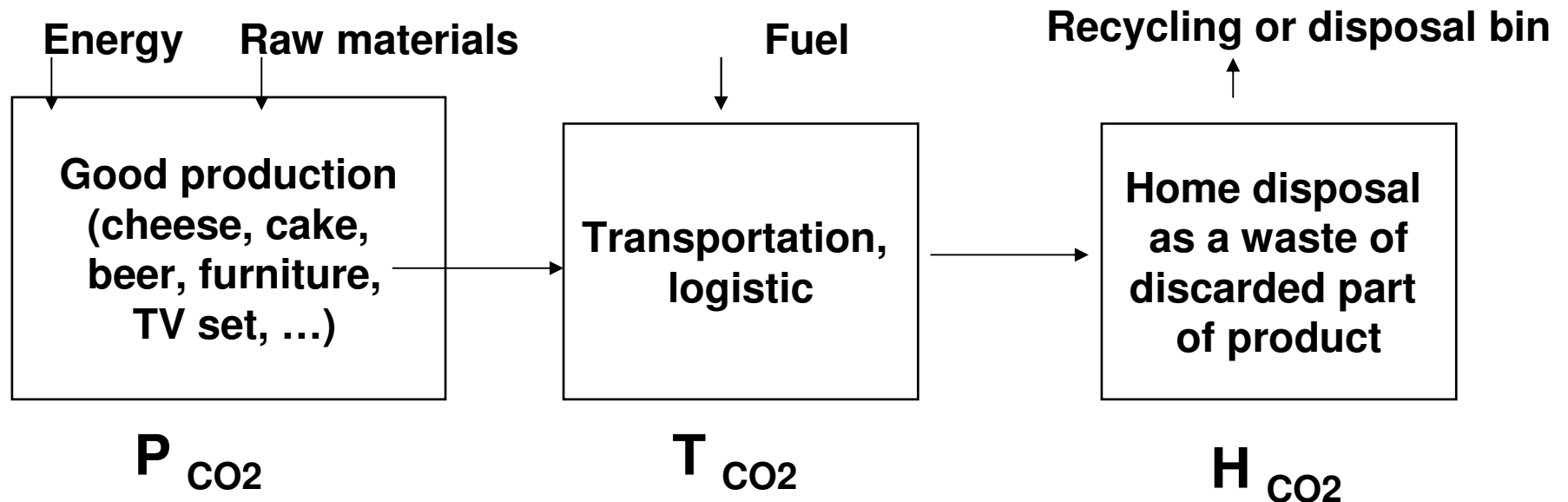
Win Win Win Win Win Win Win Win Win Win Win Win

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One benefit of waste prevention is CO₂ reduction

- This CO₂ reduction is the result of several reductions, partly upstream the buying and use by the consumer.
- Is it possible to precise where are the main reductions of CO₂ ?



The « **ADEME CARBON BALANCE** » tool

- Very difficult to evaluate « from cradle to grave » CO₂ cost of a product
(cf « LCA » 10 years ago)
- Undervalued data can be used to get a first view: for instance, do we have
$$P_{CO_2} = H_{CO_2} \quad \text{or} \quad P_{CO_2 \gg \gg} H_{CO_2} ?$$

(in the second case, leverage can be used).
- The « *ADEME BILAN CARBONE* » tool can be used for such rough estimations

The « **ADEME CARBON BALANCE** » tool

The ADEME ACB = database with average figures for the **CO₂ eq.** of a large number of actions or products :

- To produce 1 Ton of steel from scrap or 1 Ton of new plastic from oil
- To produce 1 pound of corn or beef
- To transport 1 ton of products, according to the size and type of truck
- ...Whatever you need

The « **ADEME CARBON BALANCE** » tool

- Different greenhouse gases considered (with their GWP), not only CO₂
- Data expressed as Carbon
(1 ton eq. Carbon = 3,67 ton eq. CO₂)
- Database takes French situation into account, especially for electricity production (1 French kWh = 31g C ; 1 UE-25 kWh = 142g C)
- Also for waste treatment, recycling, ...
- A rough tool, but often a good indicator!

Three examples using carbon balance to evaluate impact on CO₂ of reduction of waste

3 waste prevention actions proposed by the Mayor of city (pop. 600 000) : « *I will try*

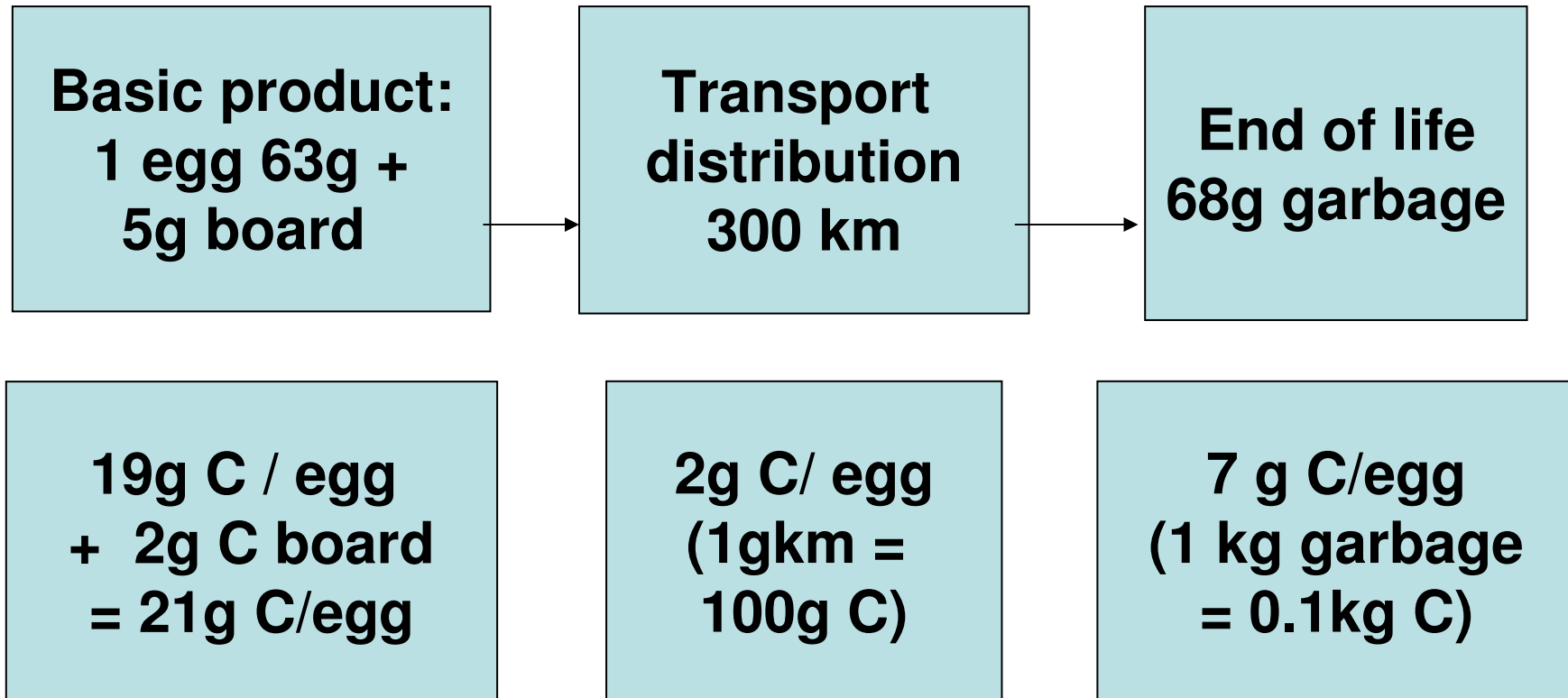
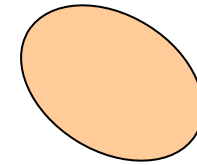
- *to have each inhabitant avoid wasting 1 egg this year (sometimes, the 2nd rank eggs in fridge are too old, and you have to bin them)*
- *to have 1 in every 2 citizens drink tap instead of bottled water, in their daily use*
- *to have the producer of bottled spring water reduce the over packaging of his 6 bottles packs of spring-water »*

THE FORGOTTEN EGG EXAMPLE

What is the CO2 impact if a public campaign succeeds in avoiding 1 egg/year being thrown out by each inhabitant ?

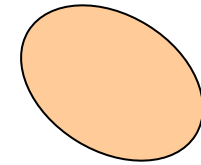


THE FORGOTTEN EGG EXAMPLE



1 egg = 30 g C

THE FORGOTTEN EGG EXAMPLE



For a city of 600 000 inhabitants,

600 000 eggs saved per year :

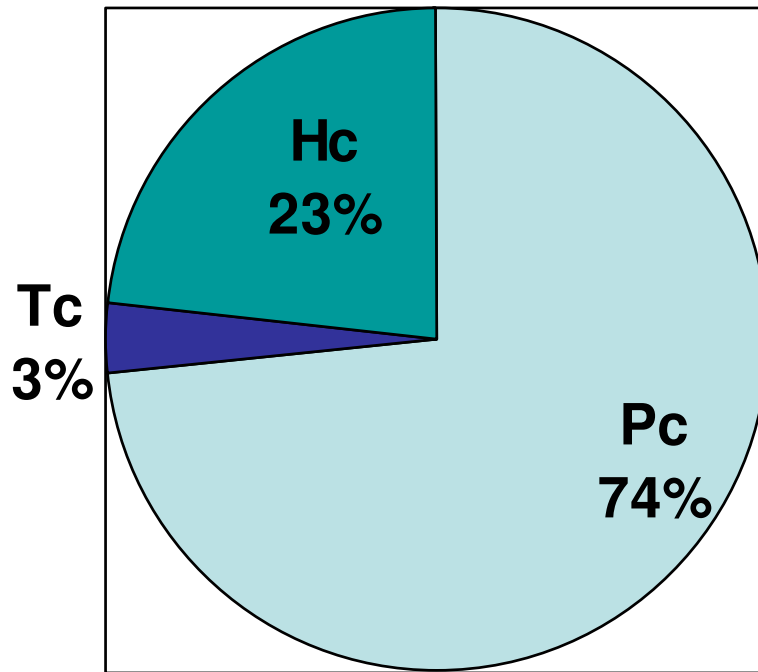
**P CO₂ =
12,6 T C / year**

**T CO₂ =
0.6 T C / year**

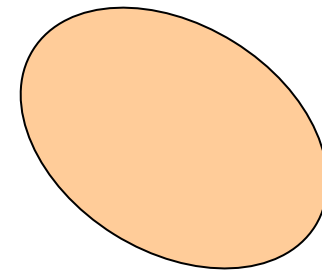
**H CO₂ =
4 T C / year**

Pc + Tc + Hc = 17.6 T of carbon

**One « no-waste egg » per inhabitant
avoids 17,60 T of carbon**



THE FORGOTTEN EGG EXAMPLE



- $\frac{3}{4}$ of the CO₂ saving is in the product itself (egg).
- The impact of « waste egg » no-treatment is less than $\frac{1}{4}$ of CO₂ at stake

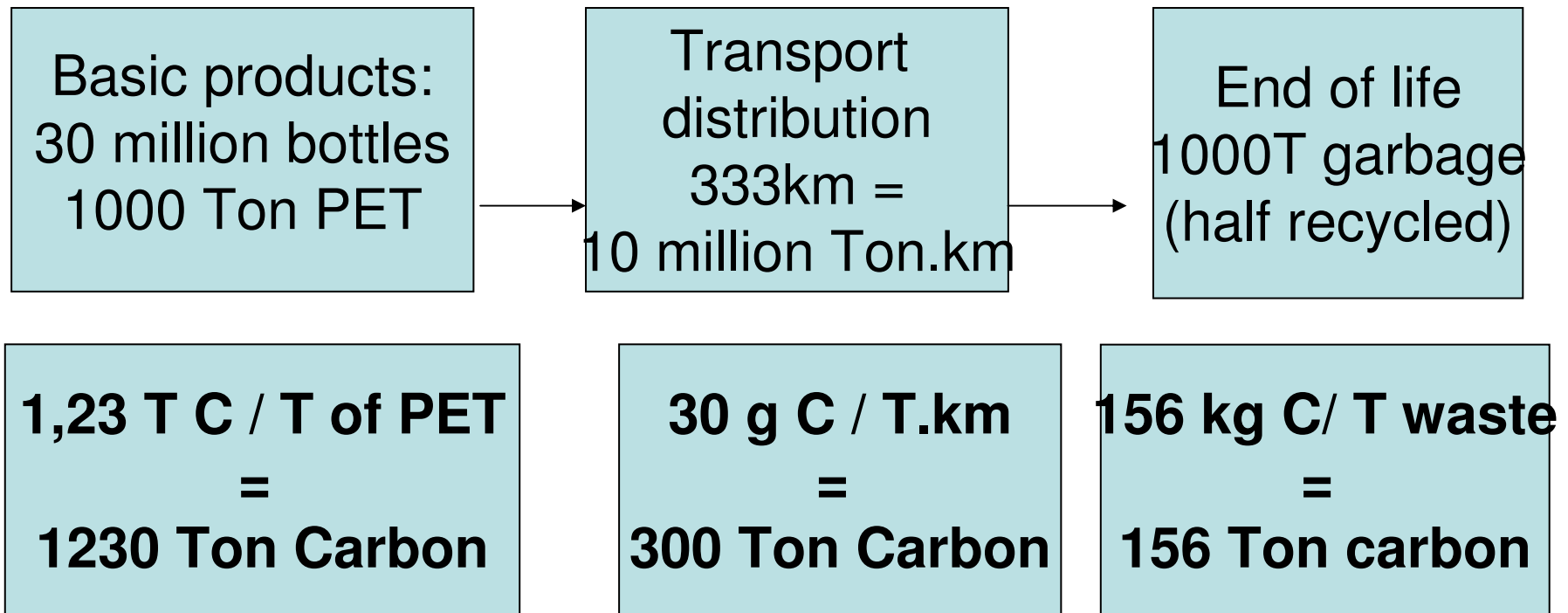
The « Drink tap water » example



**What is the CO2
impact if public
campaign succeeds**

**in avoiding 1 out of 2 flat water bottles in
a community of 600 000 inhabitants?**

The «Drink tap water » example



The «Drink tap water» example



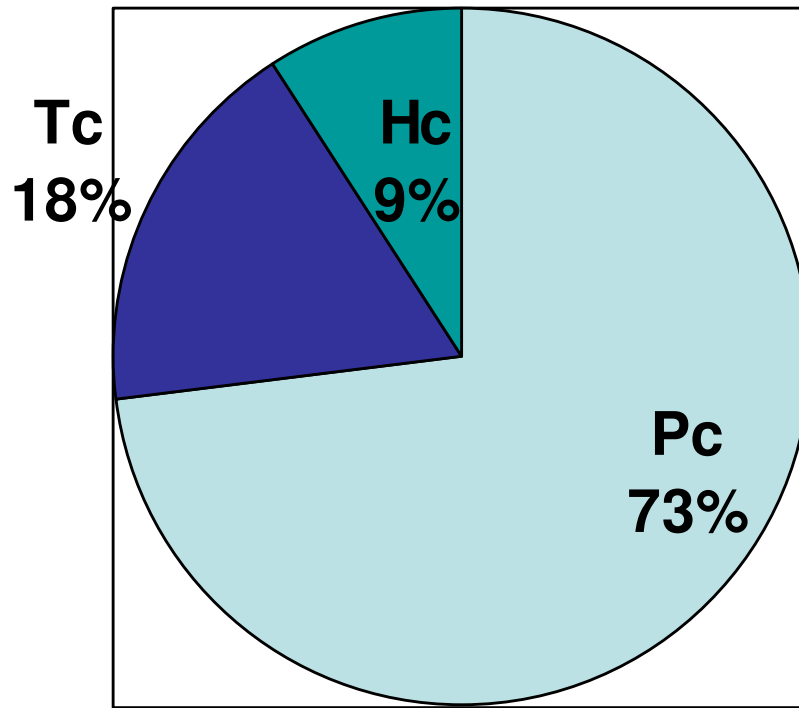
With a halving of spring water bottles for 600 000 inhabitants, reduction of CO2 emission is :

P CO₂ =
1230 T C / year

T CO₂ =
300 T C / year

H CO₂ =
156 T C / year

$$P_{CO_2} + T_{CO_2} + H_{CO_2} = 1686 \text{ T carbon}$$



The « Drink tap water » example



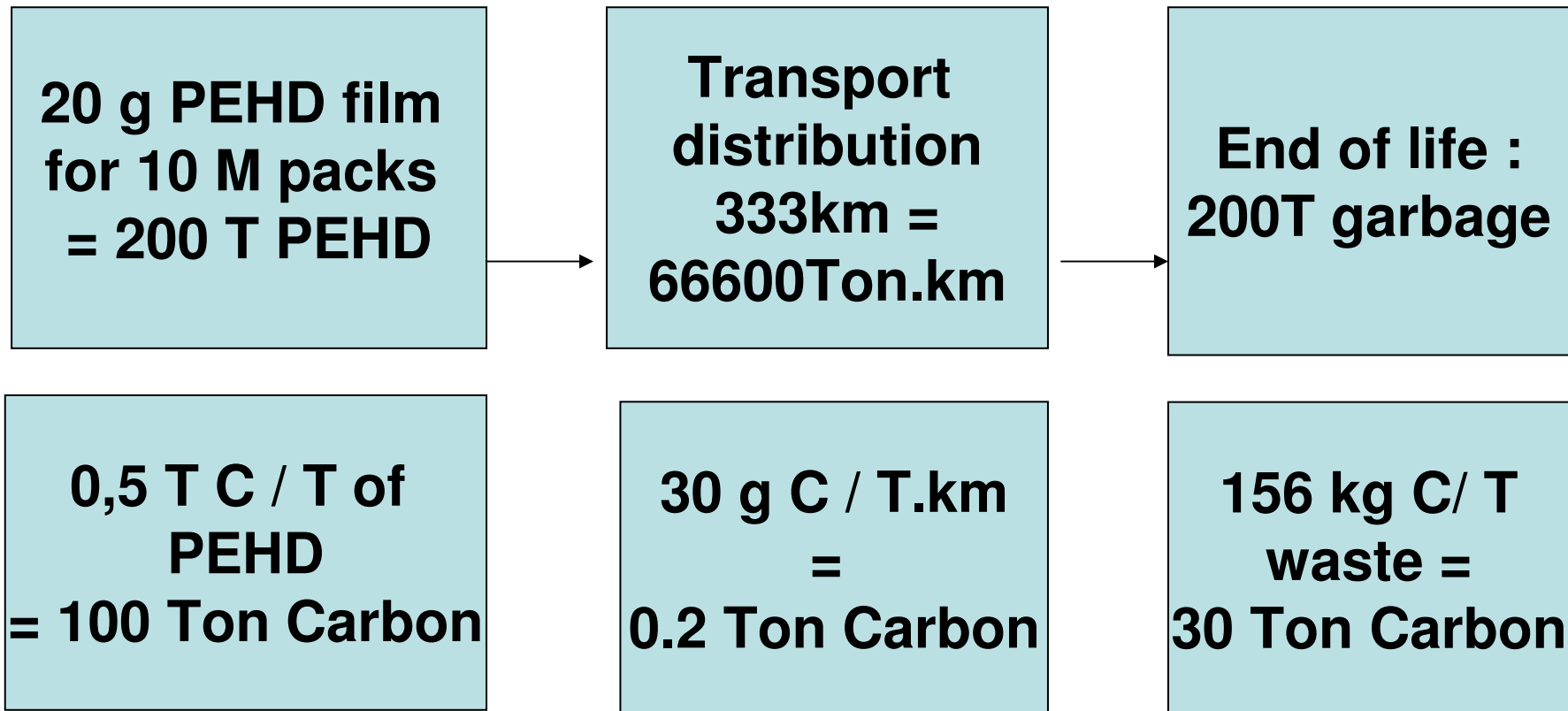
- $\frac{3}{4}$ of the CO2 saving is again in upstream product (here, PET packaging)
- The impact of waste treatment is less than 10% of CO2 at stake
- The prevention of CO2 emissions by transport is twice that of emissions from waste treatment

The «over packaging reduction»



**What is the CO2 impact
if the bottled spring water
producer reduces or suppresses
the PEHD over packaging film for
6 bottle packs (for 600 000
inhabitants)?**

The «over packaging reduction»



The «over packaging reduction»



**By reduction of this 30g film,
total reduction of CO2 emission is
less than 10 % of CO2 reduction of
«drink tap water» action**

**For 600 000 inhabitants, only 130 Ton of
carbon, instead of 1686 Ton obtained with
the « drink tap water » campaign**

What conclusions ?

- A study for the City of Paris Climate Plan shows that the « end of life » CO2 loss of disposed rubbish is a minor part (10 %) of the total CO2 content of the city waste
: Waste prevention benefit is mainly in the “no good production” and not in the “no waste production”
- Both are important, and
- Both begins at the store, not at home

CO2 indicator : why to use it ?

- Prevention of waste is by itself justified
- Behind waste prevention is money saving, natural resources saving, energy saving, pollution saving (processing and transport of good, and waste treatment)
- Global warming adds CO2 outline : waste prevention is CO2 saving
- This in-fashion outline, we have to use it !

CO2 indicator : how to use it ?

We have to take care to several points :

- Pay attention to the units : g C, T CO2, ...
- Have idea of others popular data about CO2 (car emission, ...)
- Include all CO2, and not only waste treatment
(example of plastic in landfill : zero !)
- Don't forget the other reasons for waste prevention