Rijksdienst voor Ondernemend Nederland

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Assessment of CO_2 emissions of electricity and heat used at industrial plants

Mirjam Harmelink (SQ Consult)

Lex Bosselaar (RVO)

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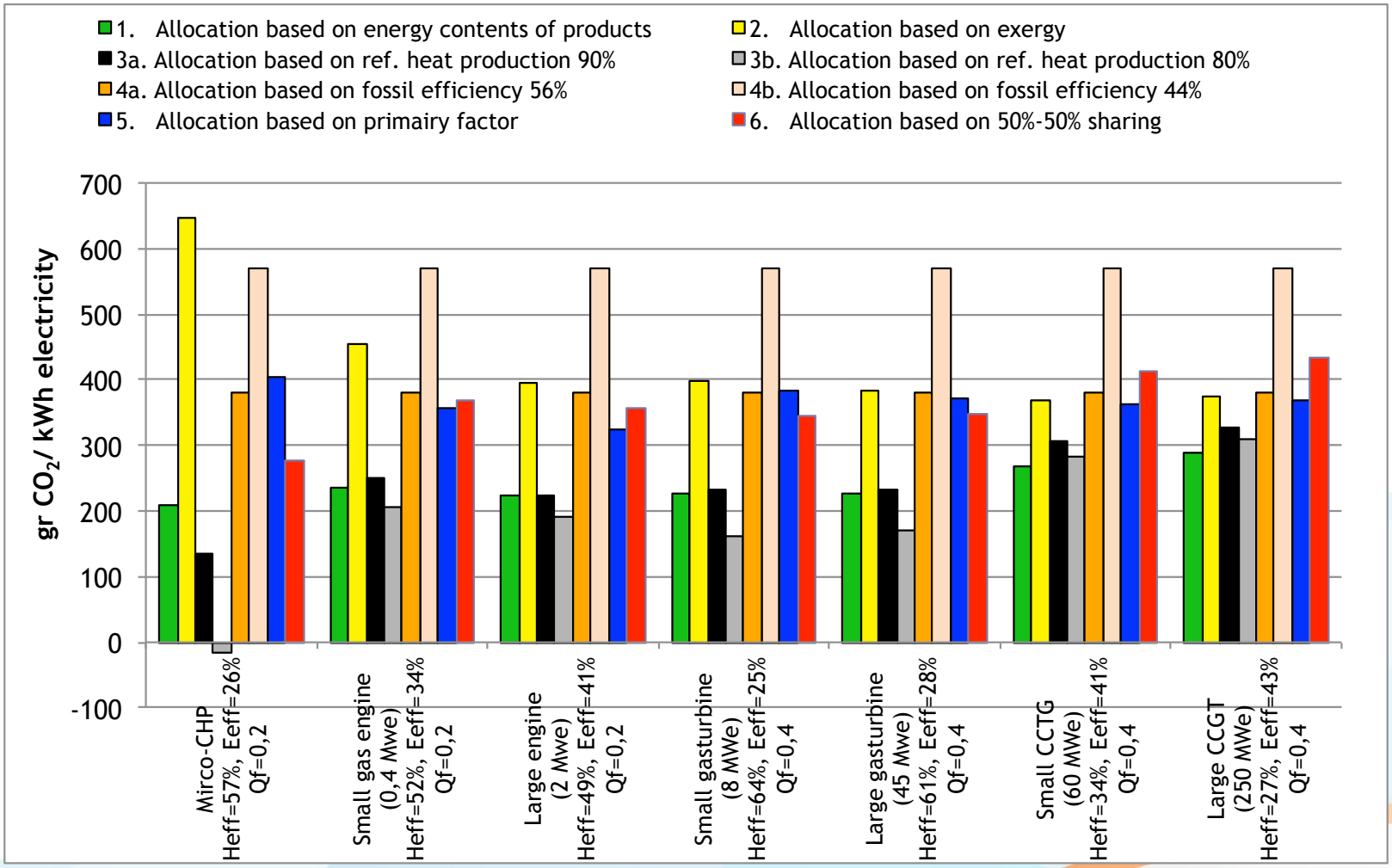
Need for assessment methods

1. Clear and unambiguous calculation rules for attributing CO_2 emissions to heat and electricity are currently lacking (for the Netherlands applied factors ranged from 0.4 to 0.7 kg of CO_2 per kWh)
2. As a consequence claimed CO_2 emissions reductions for different options – like cross border delivery of heat, end-use energy efficiency measures and use of renewable energy sources - in the industry cannot be properly assessed and "fair" comparison cannot be made.

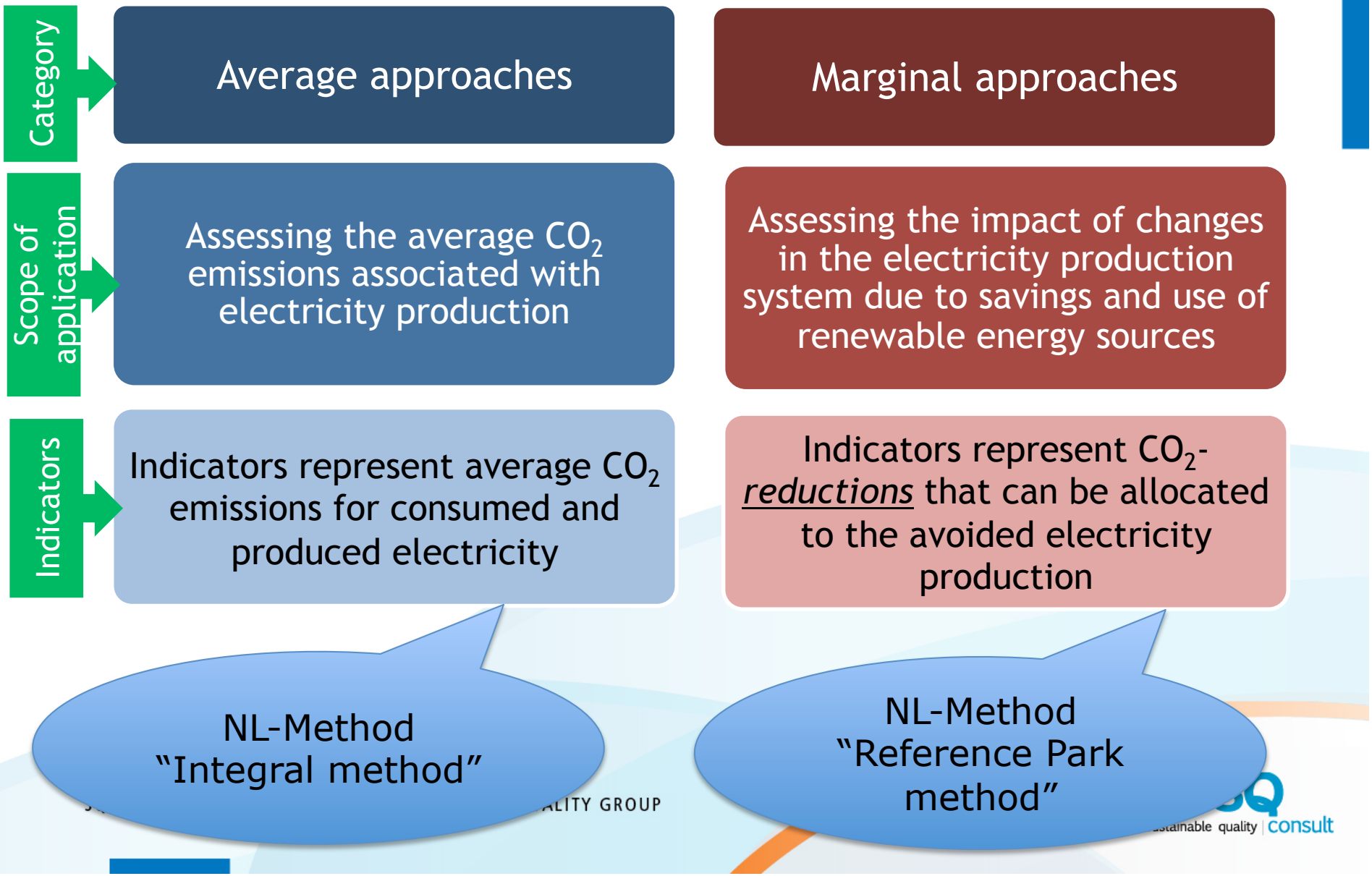
A: Allocating CO_2 emissions to *electricity and heat produced by CHP installations*

Allocation Method	Advantage	Disadvantage
1 Energy content of heat and electricity	Simple and transparent	Does not account for quality of products
2. Exergy content of heat and electricity	Accounts for quality of products	Quality factor often unknown, relatively high share of fuel is allocated to electricity
3. All savings allocated to electricity	Simple	Heat production is relatively poorly valued, choice must be made for reference heat efficiency
4. All savings allocated to heat	Simple	Electricity production is relatively poorly valued, choice must be made for reference electricity production efficiency
5. Primary energy content of heat and electricity	Simple and transparent and relatively insensitive for choice of reference situation	Choice must be made on reference efficiency for electricity production
6. 50%-50% sharing of saving between heat and electricity	"Fair sharing" of savings among heat and electricity	Definition of "Fair sharing" is open for discussion

A: Allocating CO_2 emissions to *electricity and heat produced by CHP installations*



B: Allocating CO_2 emissions *to electricity consumption, production and savings*



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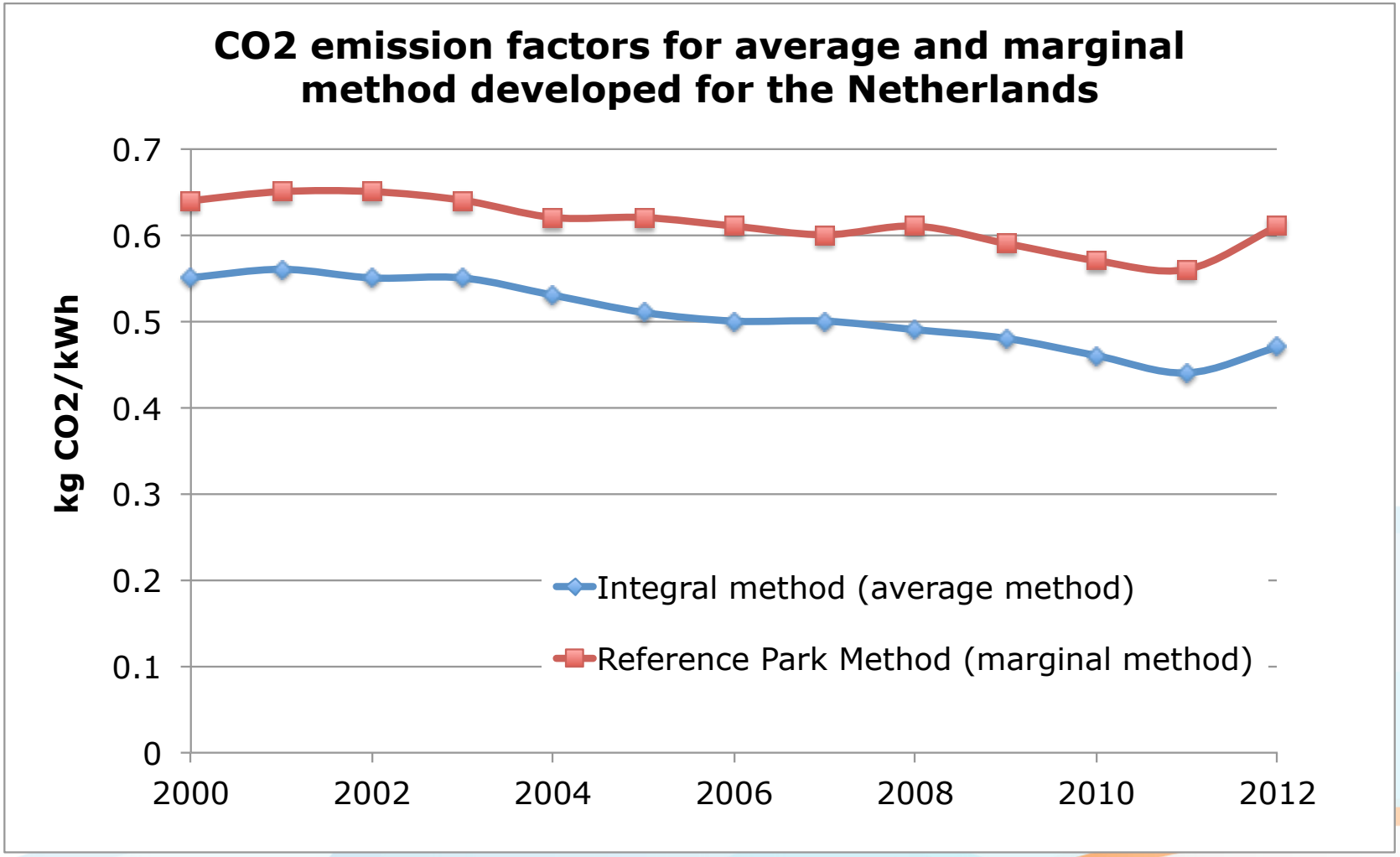

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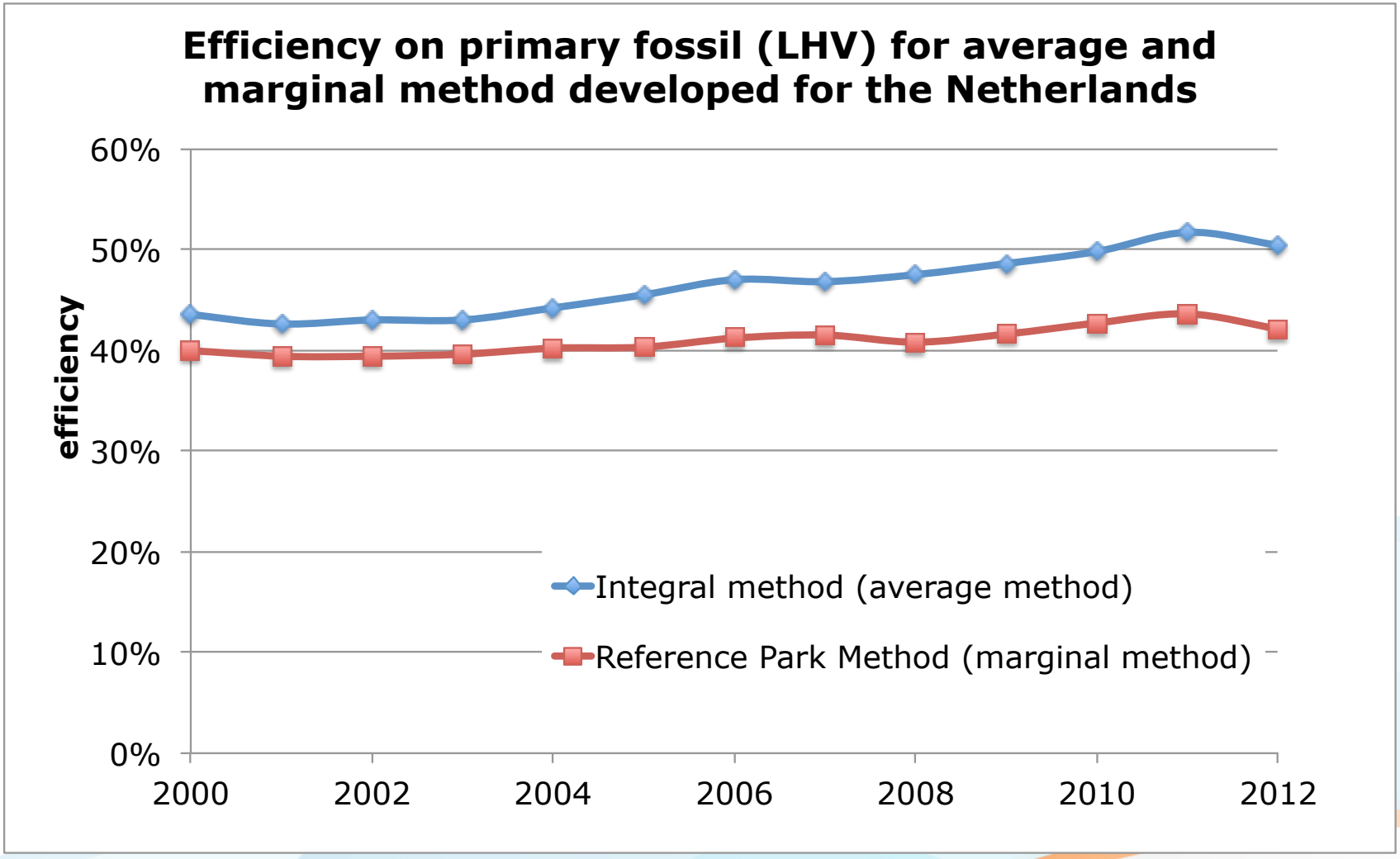
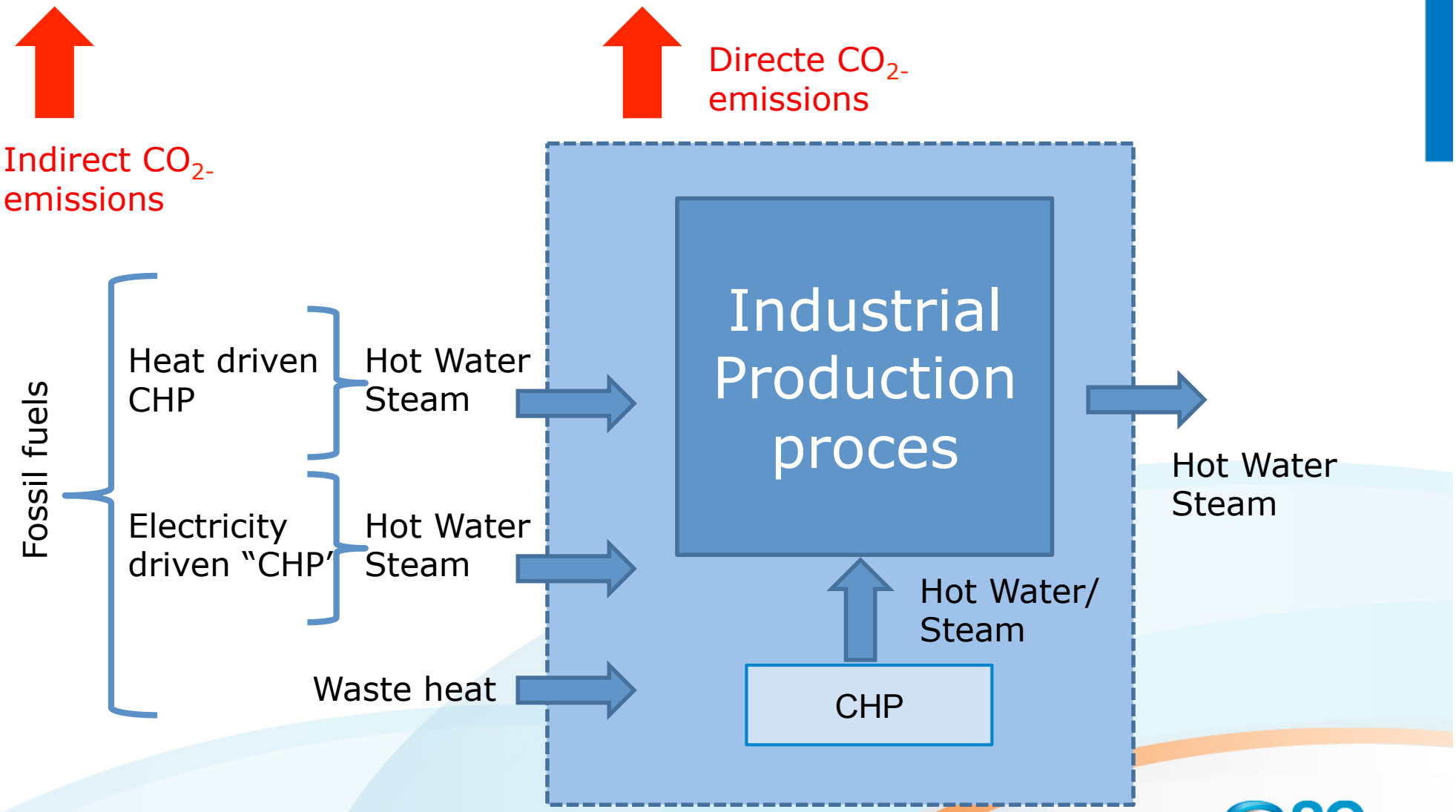


C: Allocating CO_2 emissions *to imported and exported heat at industrial locations*



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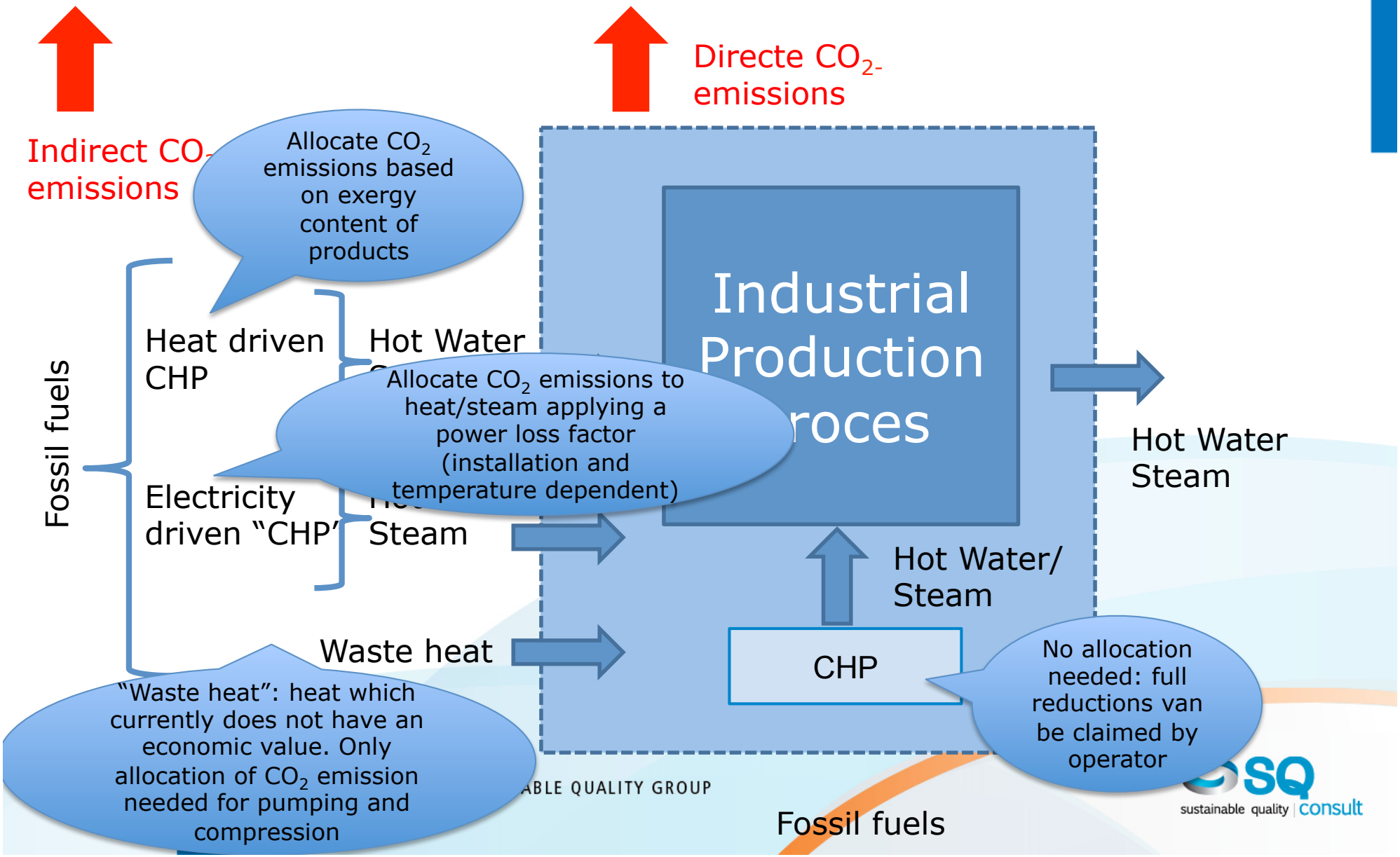

Conclusions and discussion

1. When allocating CO_2 emission (reductions) to heat and electricity it is important to be transparent on the applied method
2. To ensure a "fair" comparison between emission reduction options and among Member States a further harmonisation of methods is needed
3. Applied emission factors should probably reflect changing in the energy system, e.g. the growing share of renewable affect the way CO_2 reduction from energy savings are valued.