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Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Life Cycle Costing (LCC)

Basic principles, applications and implications for GPP

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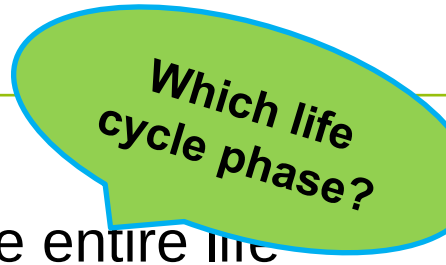
Regional Capacity Building on the application of LCA and LCC in Public Procurement, Advancing and Measuring Sustainable Consumption and Production (SCP) for a Low-Carbon Economy in Middle-Income and Newly Industrialized Countries (Advance SCP) in Southeast Asia

Port Dickson, Malaysia, 15.11.2016 – 17.11.2016

Definition LCC



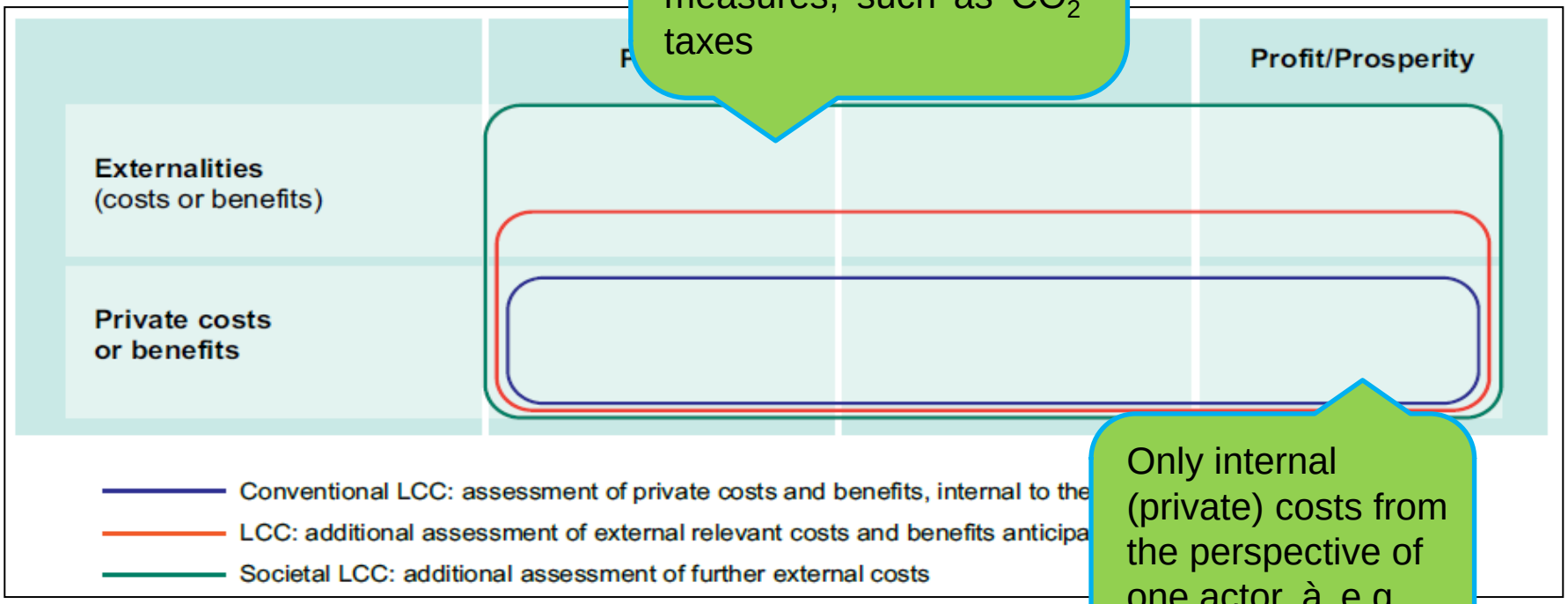
- Assessment of all costs which are connected to the entire life cycle of a certain product.

- The costs are directly covered by one or more actors within this life cycle.

- By using this methodology, consumers are able to compare and evaluate alternative products and assess their economic viability.

Types of LCC

All internal & external costs in all life-cycle stages are monetarized à a good basis for policy measures, such as CO_2-taxes



Only internal (private) costs from the perspective of one actor à e.g. Procurement Dept.

Source: UNEP/SETAC Life Cycle Initiative, 2011

Limitations of Societal LCC for use in procurement

- Too complex to be applicable on a daily basis à Enormous data requirements and uncertainties à Decisions based on such analysis can be challenged legally
- Monetary valuation of environmental impacts depend strongly upon ethical choices in different cultures & regions, e.g. valuation of lost life years in different regions of the world
- There are no market prices which represent the value of environment
- Environmental impacts are often uncertain, and impacts of today‘s activities on the environment are not always known at the deepest level of detail.
- Decision of the evaluation of damages which occur in the future are very uncertain

LCC for public procurement departments

Life Cycle Costs

Acquisition

- Purchase price
- Delivery and installation, if required

Use

Operating costs
- Electricity
- Water
- ……
- Maintenance
- Repair
- Etc.

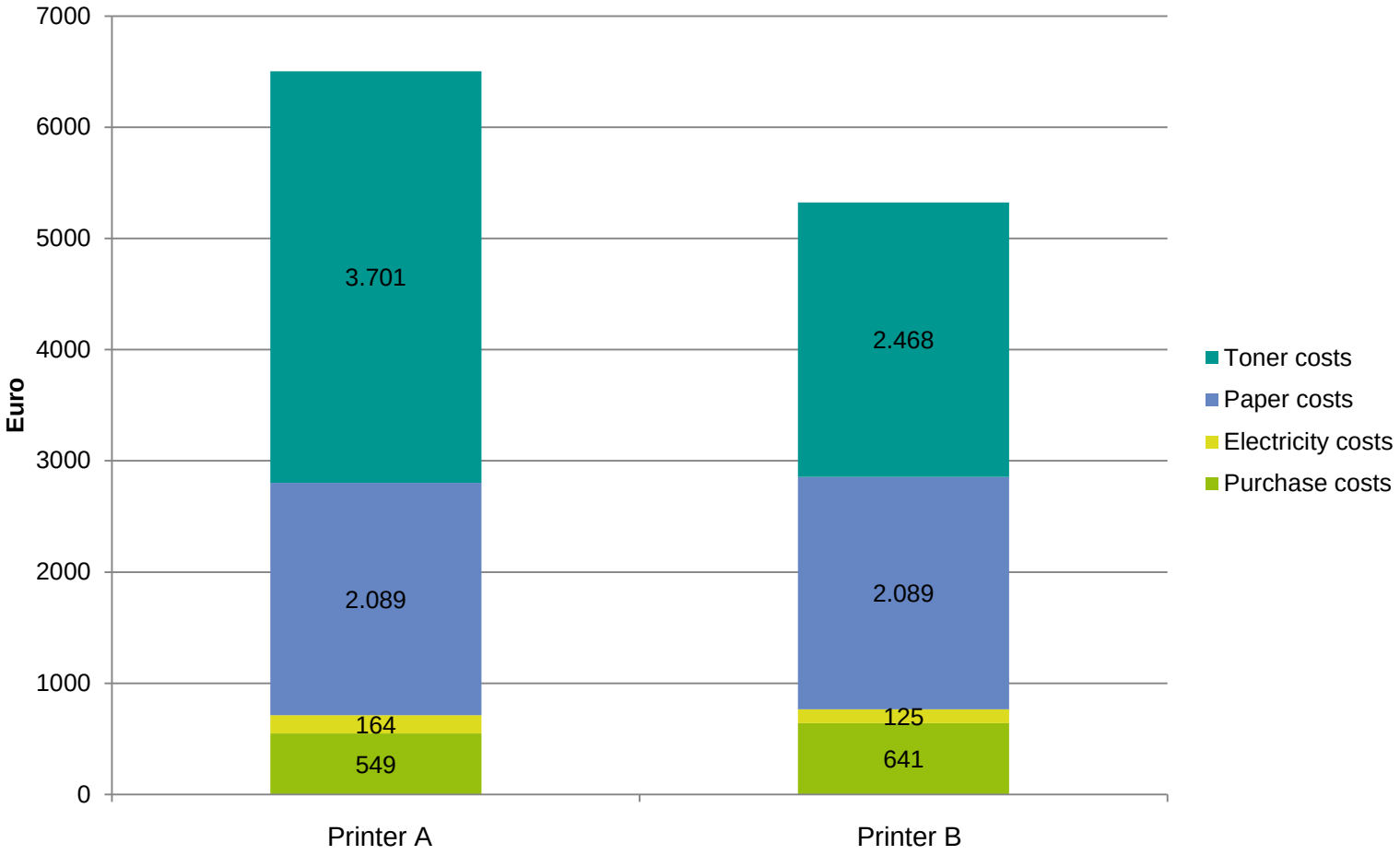
Disposal

- Collection
- Recycling
- Disposal

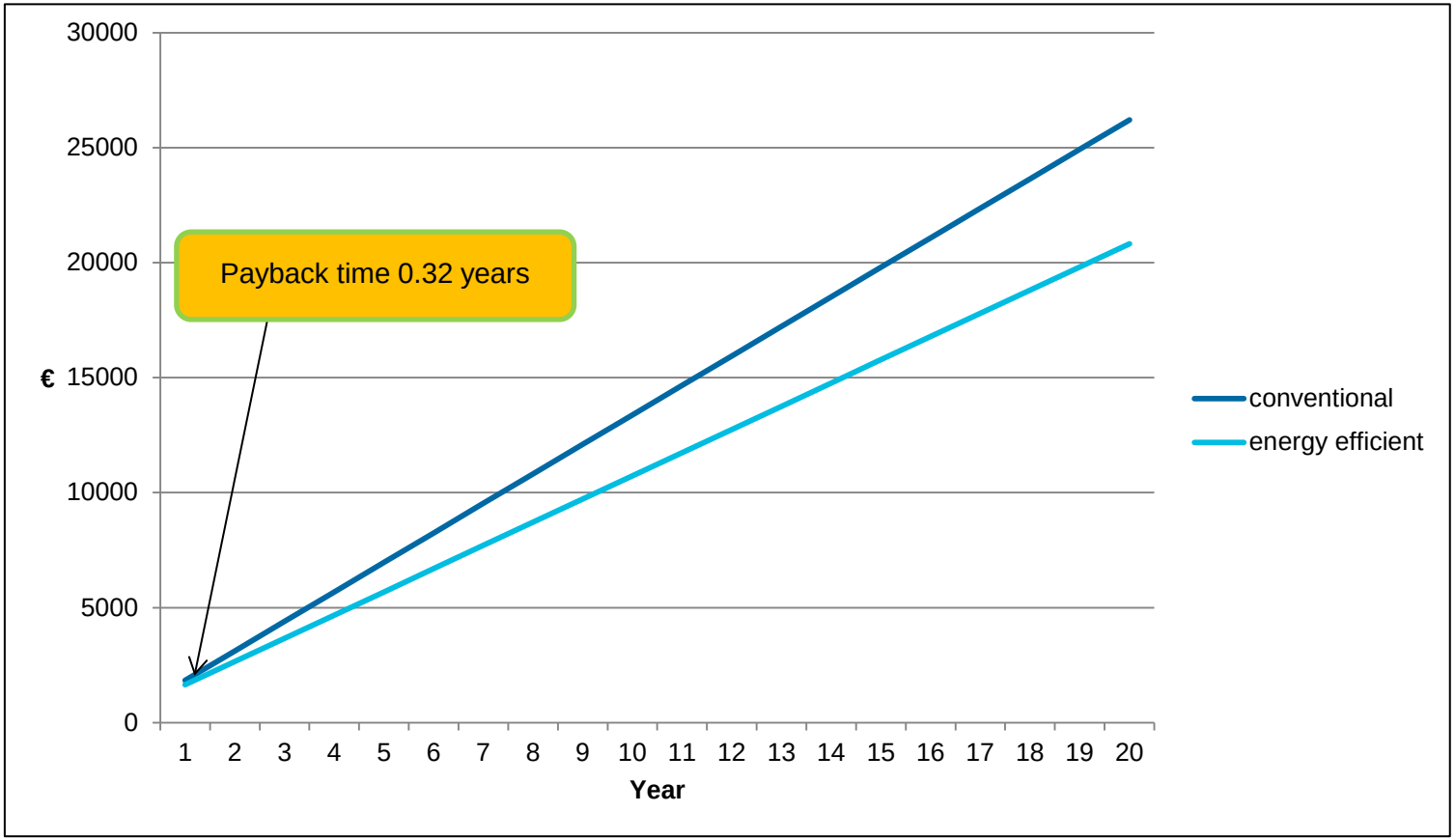
Example – Laser Printers

	unit	Printer A	Printer B
Life time	years	5	5
Purchase			
Purchase costs	Euro	549	641
Use phase			
Energy demand	kWh/a	190	145
Paper demand	Sheet/a	37.500	37.500
Toner demand	Cartridge/a	6	4
Electricity costs (EU 27)	Euro/kWh	0,1837	0,1837
Paper costs	Euro/Sheet	0,012	0,012
Toner costs	Euro/cartridge	133	133
Life cycle costs			
Purchase costs	Euro/life time	549	641
Electricity costs	Euro/life time	174,52	133,18
Paper costs	Euro/life time	2.250	2.250
Toner costs	Euro/life time	3.990	2.660
Life cycle costs	**Euro/life time**	**6.963,52 €/ life time**	**5.684,18 €/l ife time**

Example – Laser Printers



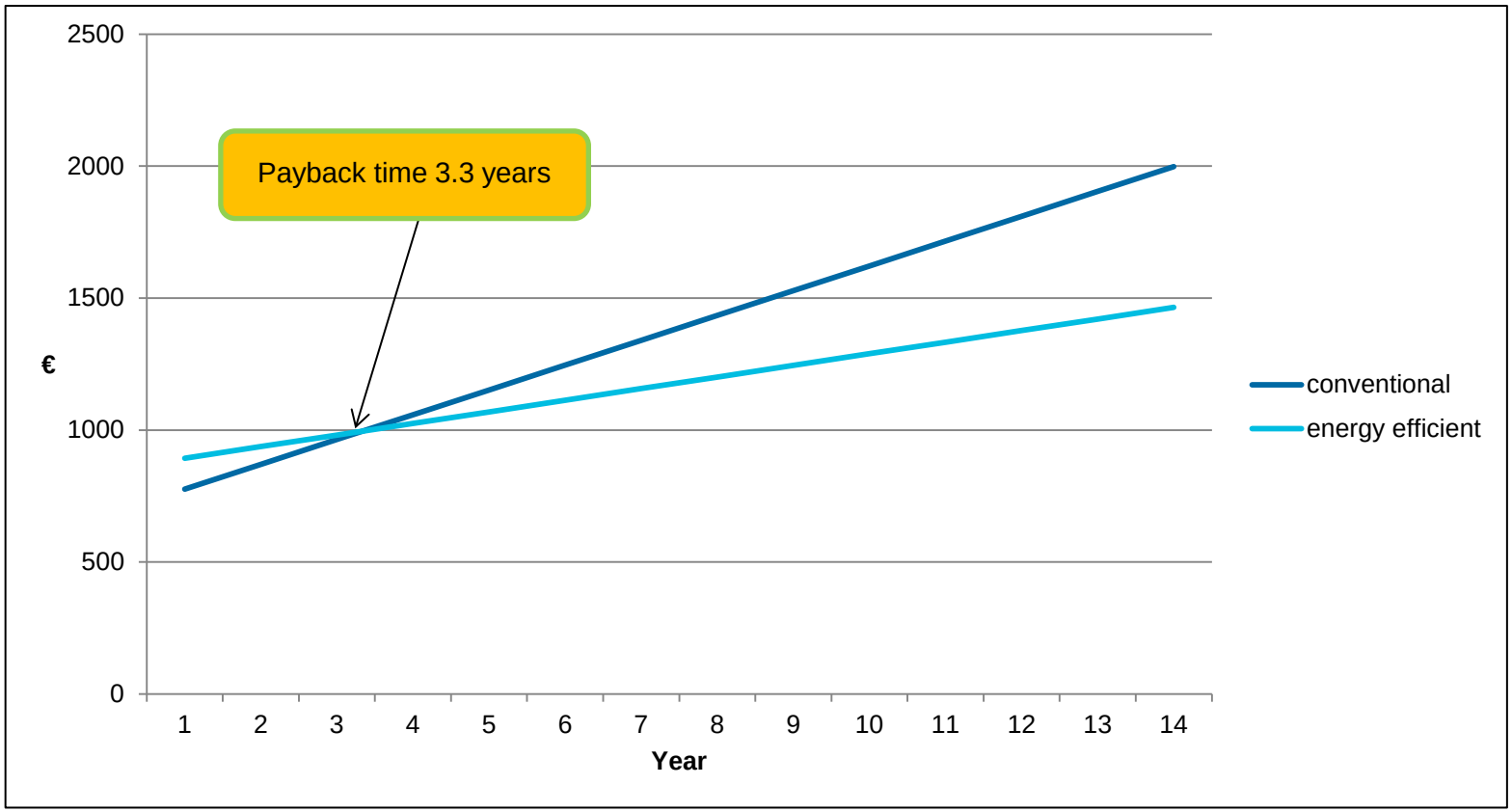
Calculation of Payback times – Laser Printer



Example – Refrigerator

Product	Energy efficiency class	Capacity (fridge/ freezer) l	Price	Life time (years)	Energy costs per year
Conventional	A+	221/94	682 €	14	94 €
Energy efficient	A+++	211/92	849 €	14	44 €

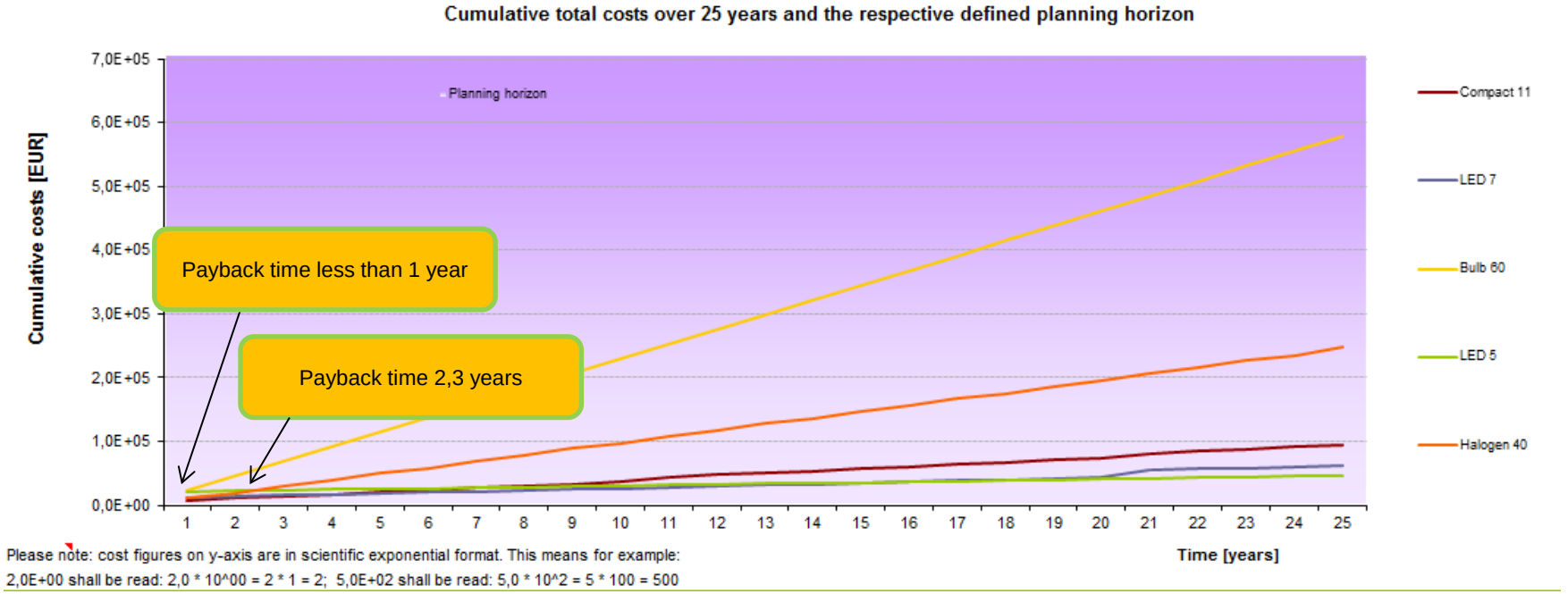
Calculation of Payback times – Refrigerator



Example – Lighting

	Watt	Price	Life time (years)	Energy costs/ year
60 W light bulb	60	0,50 €	10	104,00 €
Energy saving lamp	13	4,00 €	10	13,00 €
LED	12	10,00 €	20	2,00 €

Calculation of Payback times – Lighting



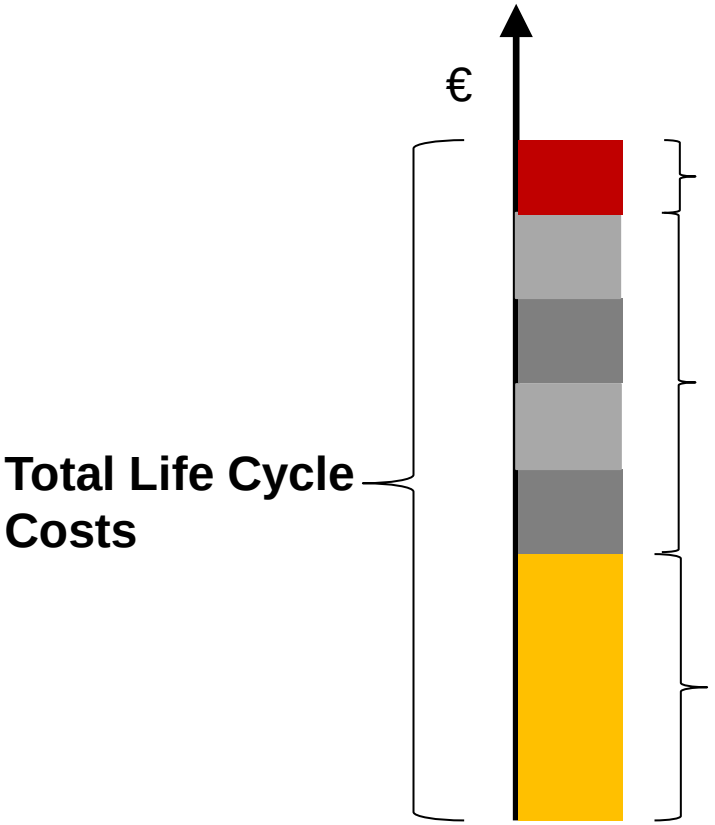
Calculating LCC with different models

Static Modelling vs Dynamic Modelling

Life Cycle Cost Analysis (LCC-A)

Static Life Cycle Cost (LCC) - Analysis

Ø The time points of the accrual of costs and savings don‘t play a role



End-of life costs
Ø e.g. Recycling costs

Operational costs over **life time:**
Ø e.g. electricity costs over 4 years

Up-front costs:
Ø e.g. purchasing price of a new appliance

Life Cycle Cost Analysis (LCC-A)

Dynamic Life Cycle Cost (LCC) - Analysis

Ø Time points of the accrual of costs and savings play a role

Up-front costs:
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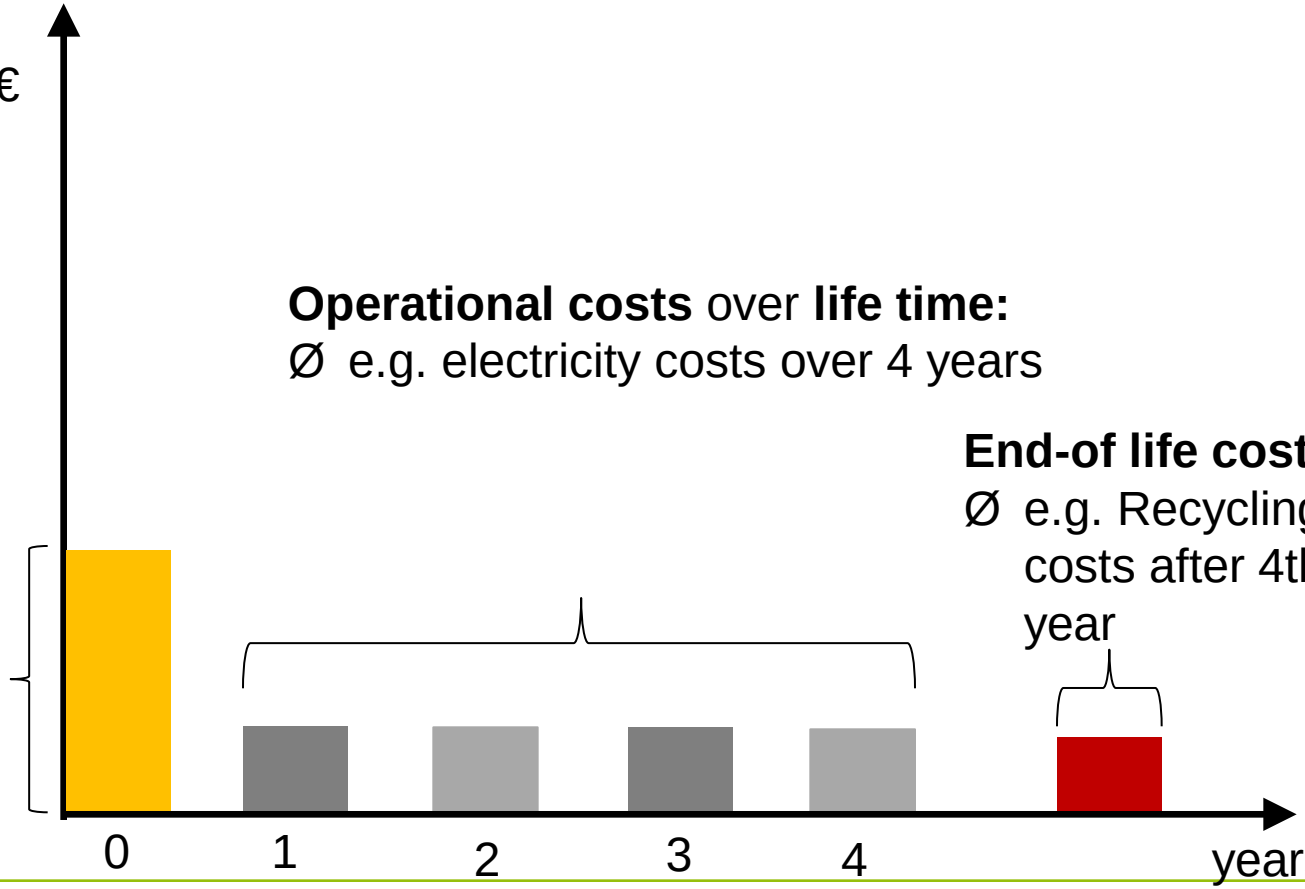

Operational costs over **life time:**
Ø e.g. electricity costs over 4 years

End-of life costs
Ø e.g. Recycling costs after 4th year

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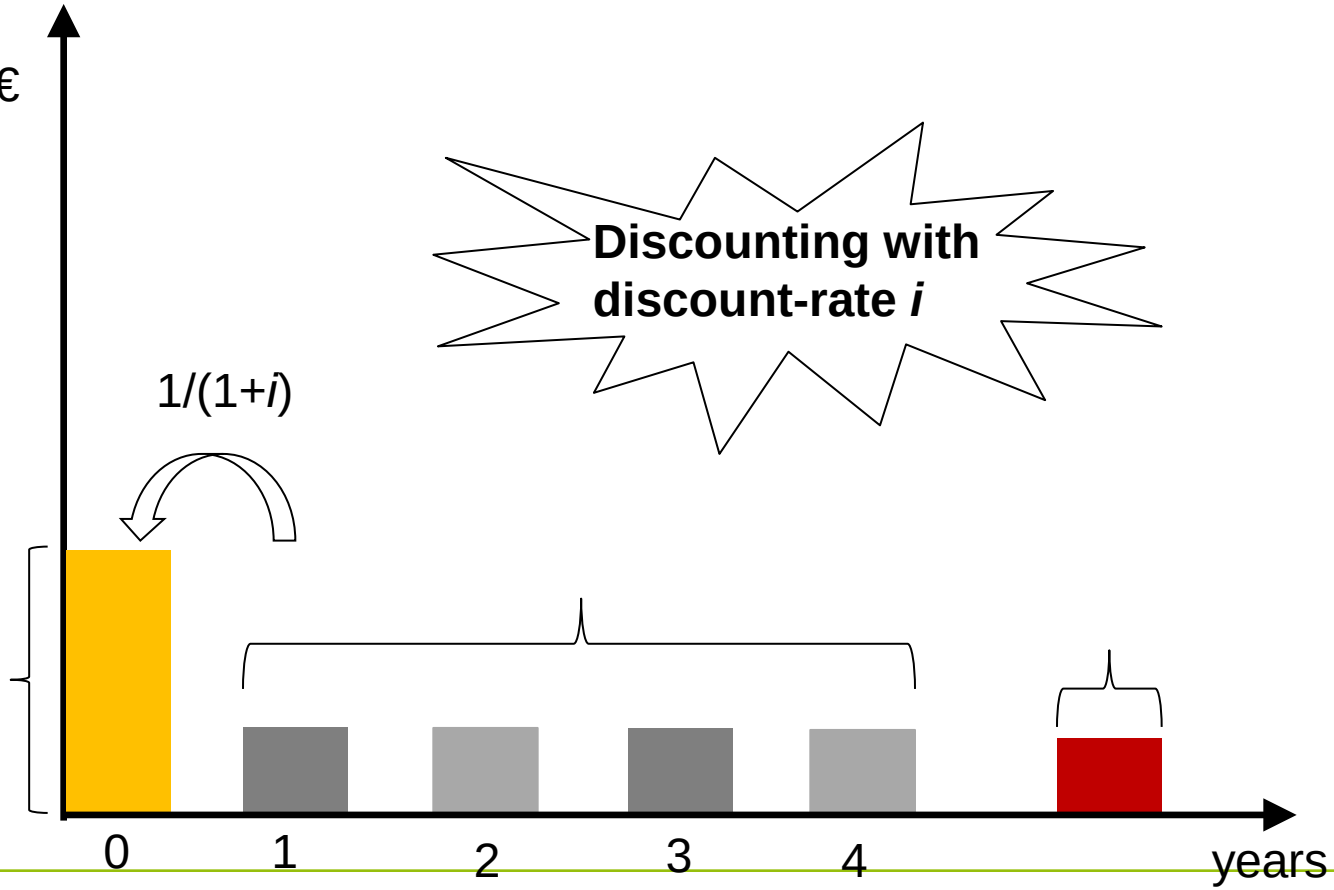
Dynamic Life Cycle Cost (LCC) - Analysis

Ø Time points of the accrual of costs and savings play a role



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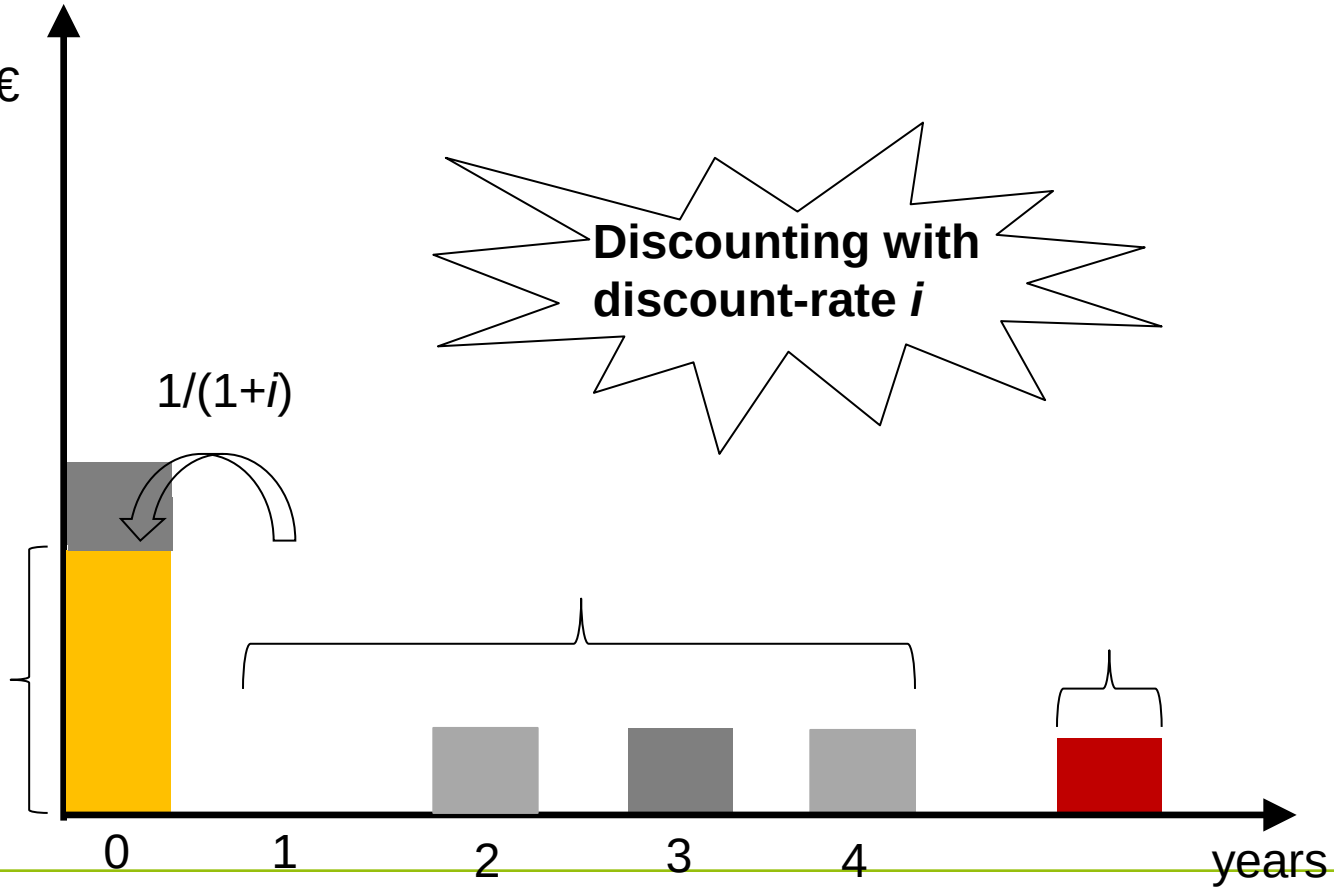

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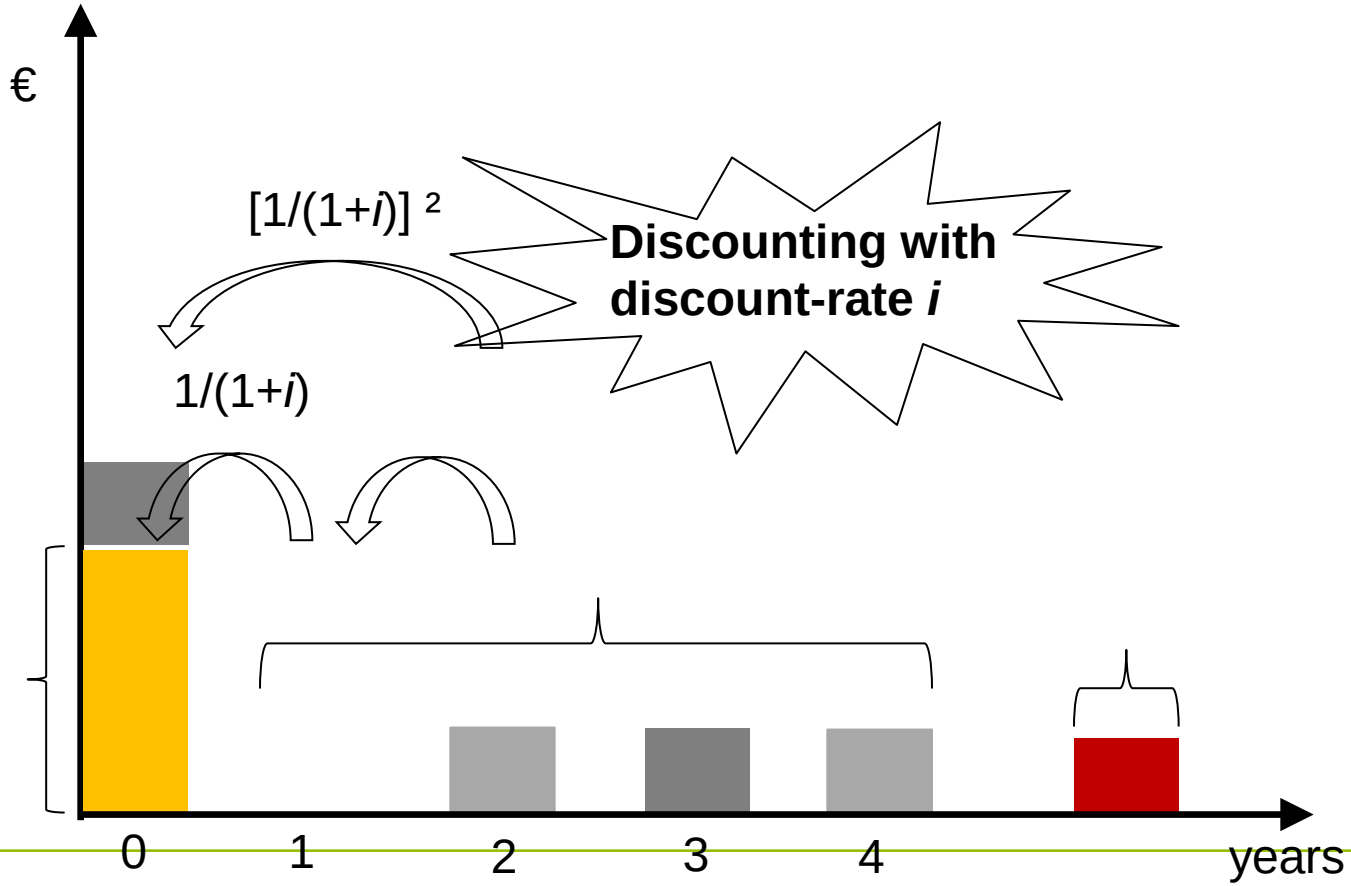

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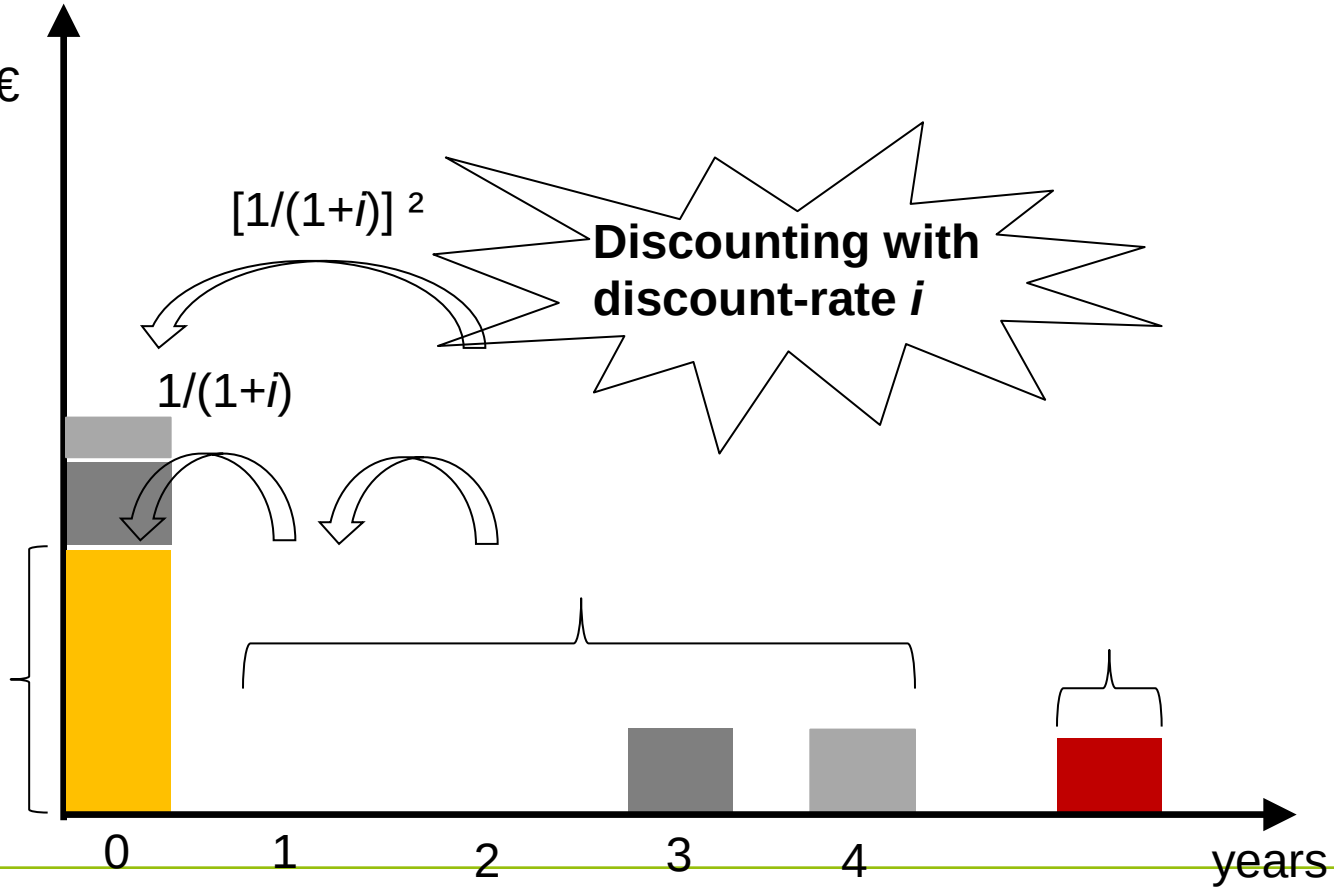

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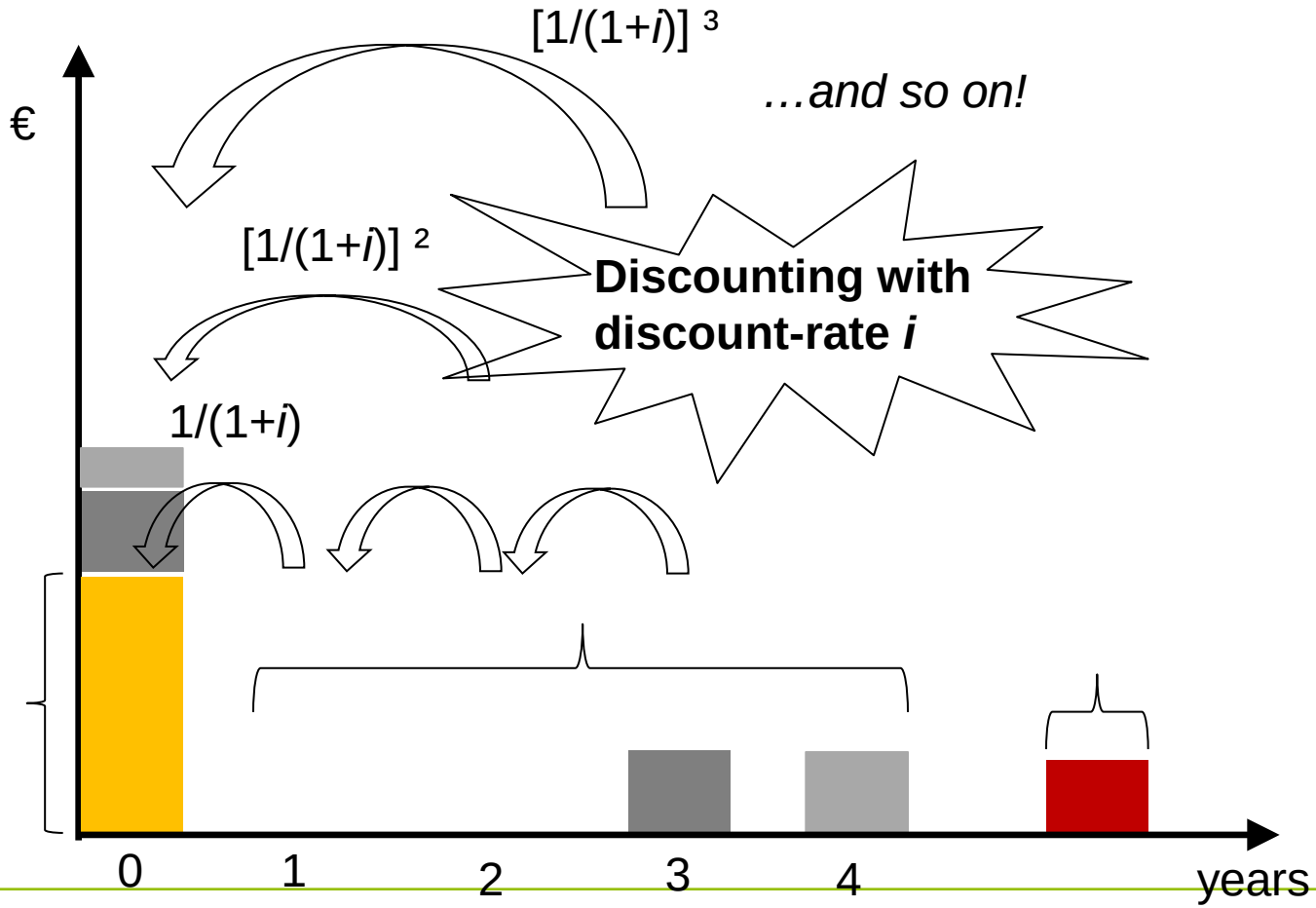

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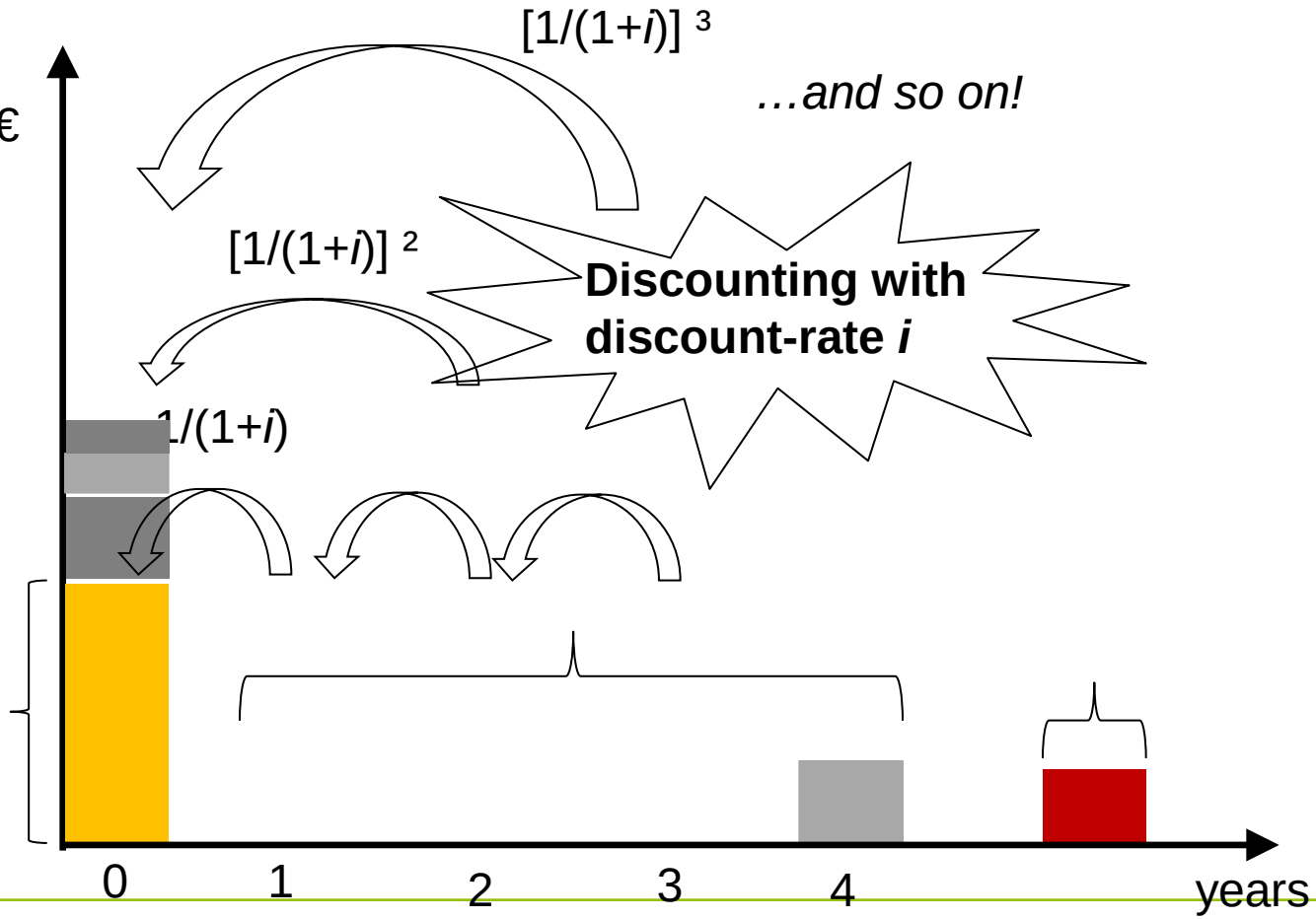

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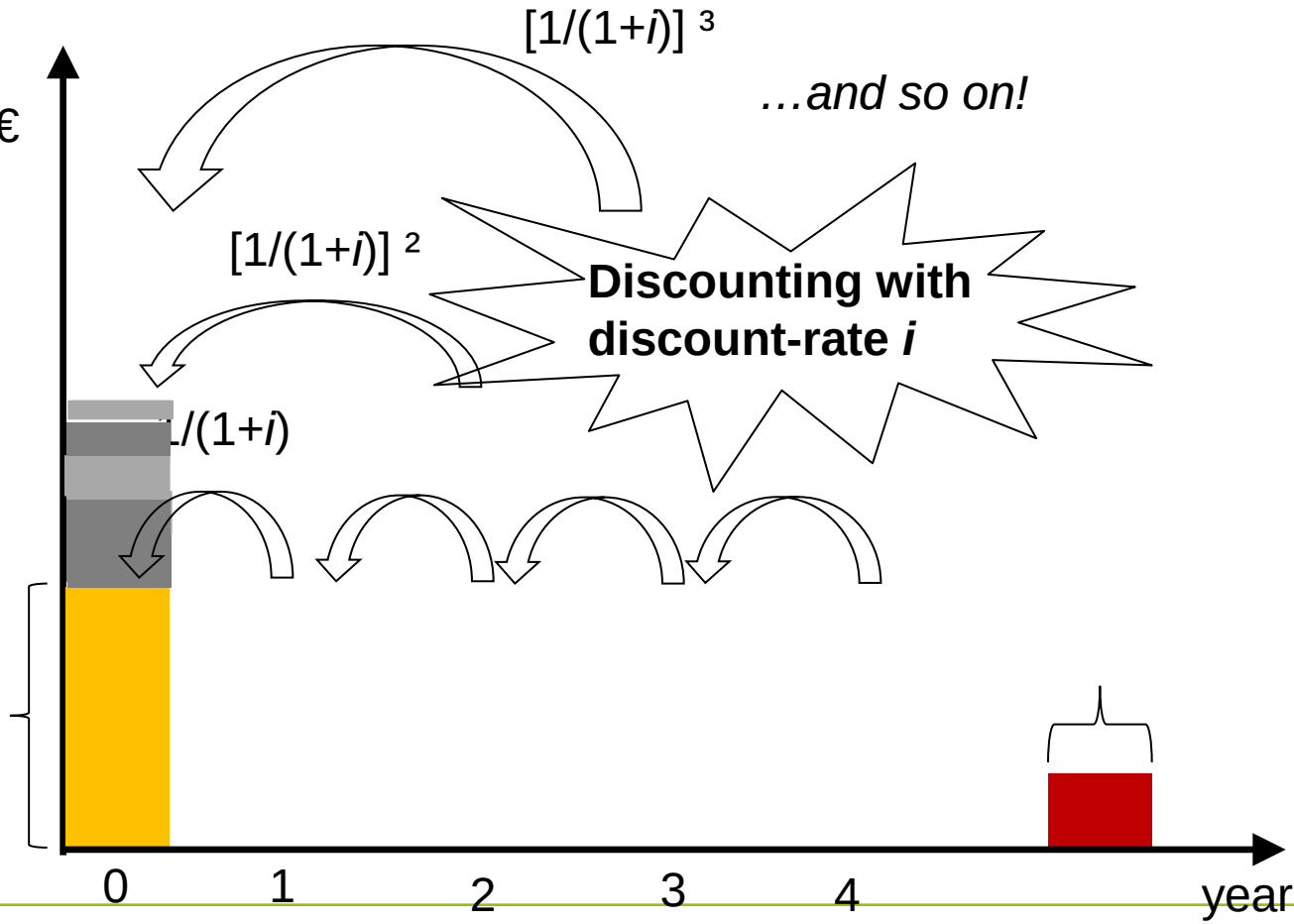

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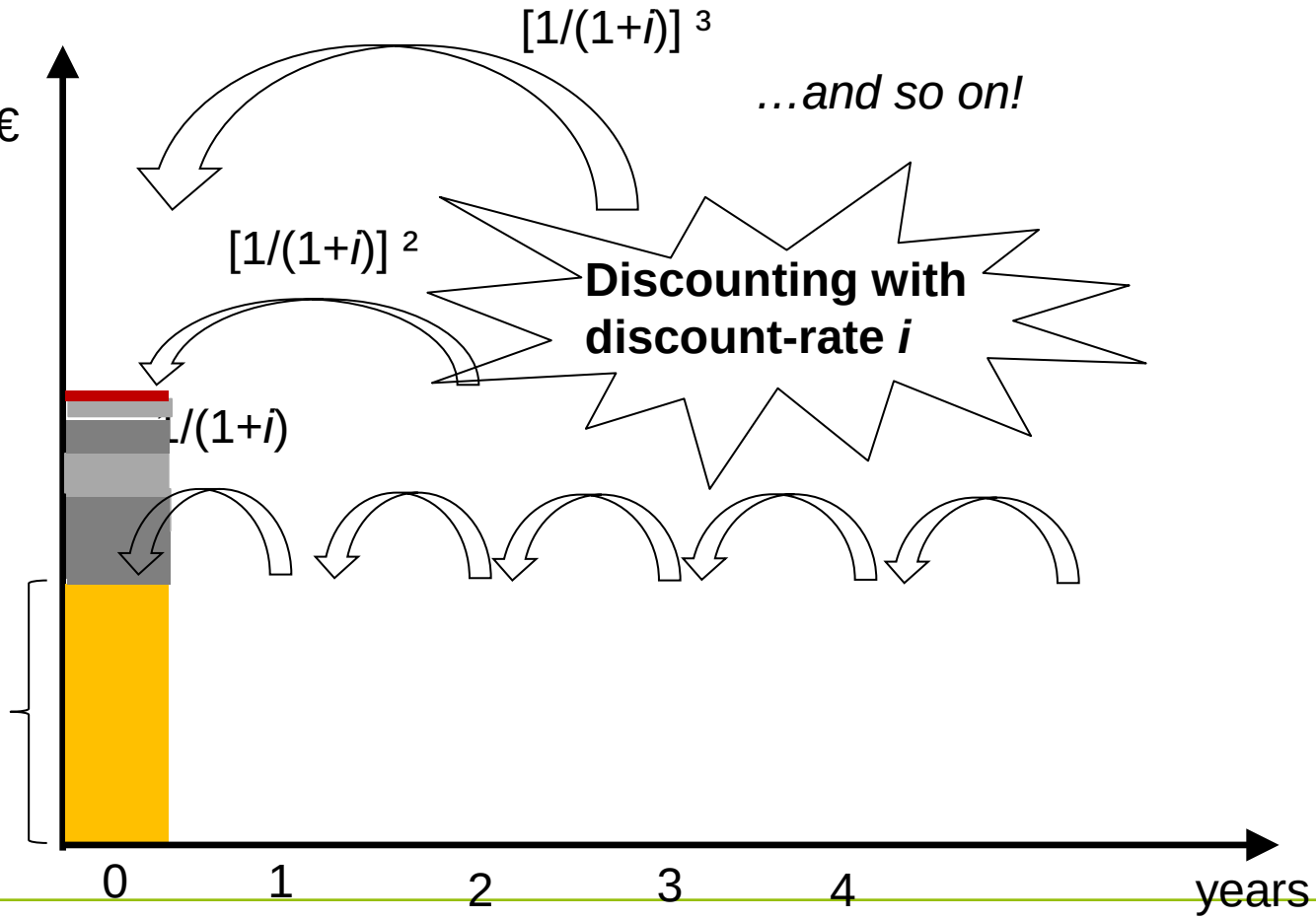

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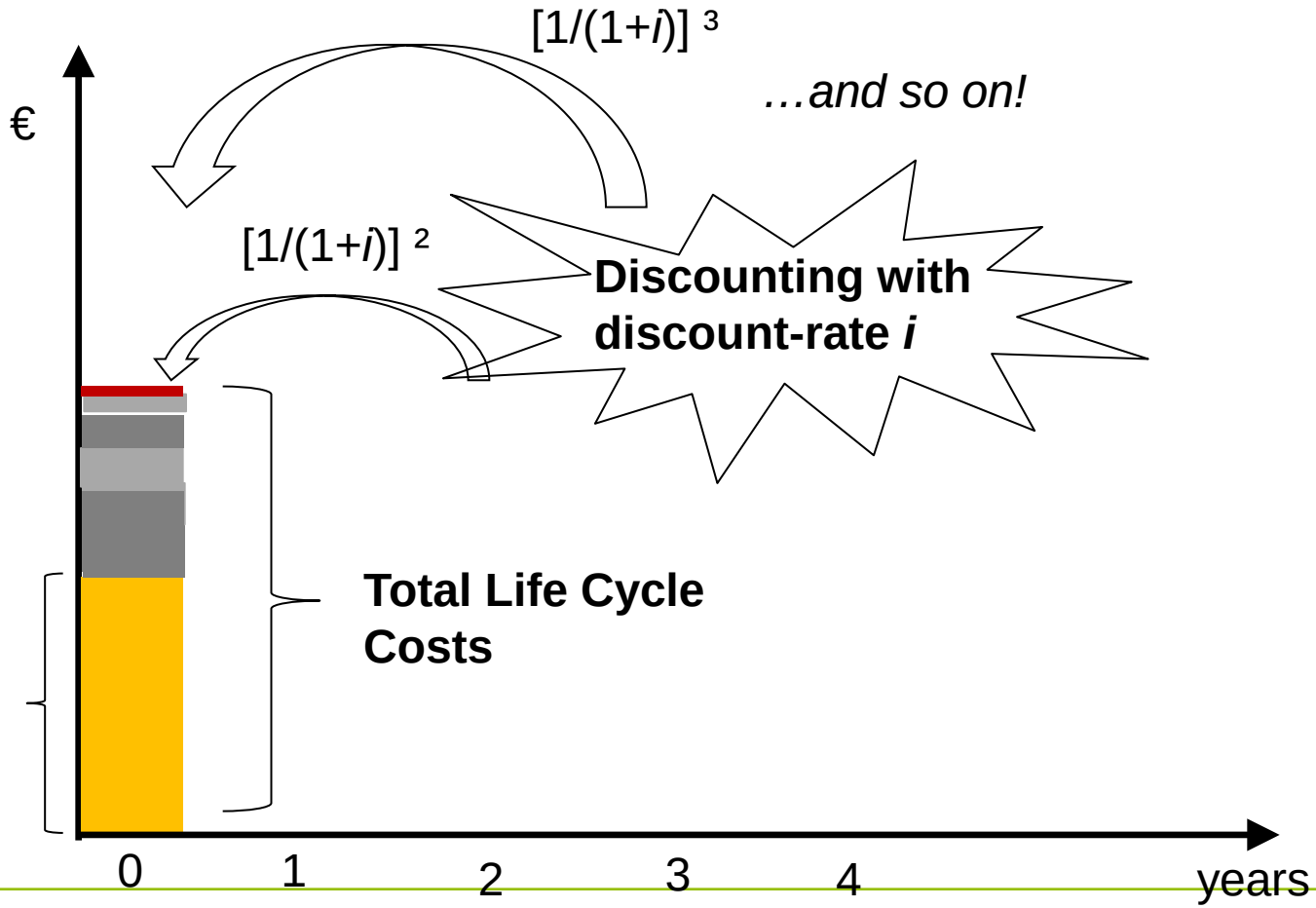

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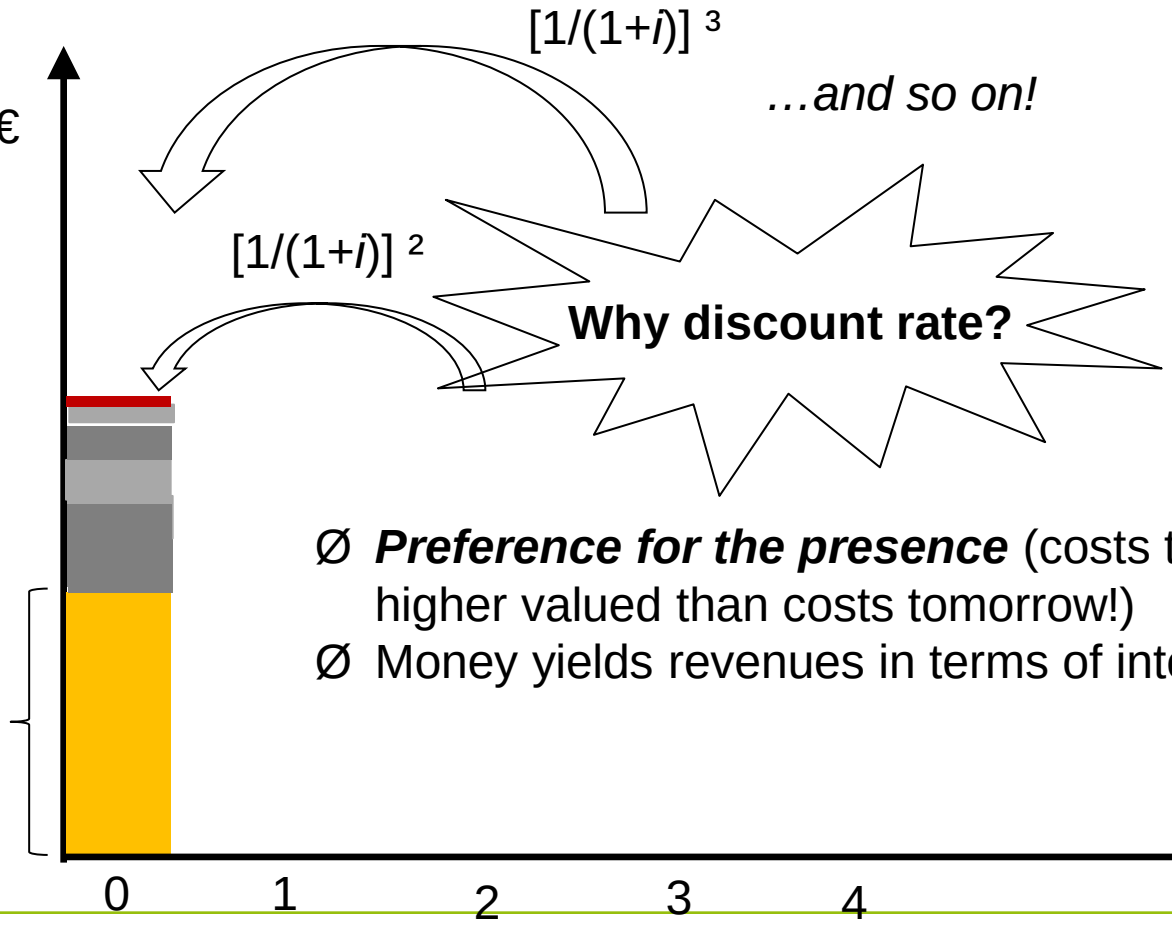

Up-front costs:

Ø e.g. purchasing price of a new appliance

Ø ***Preference for the presence*** (costs today are higher valued than costs tomorrow!)

Ø Money yields revenues in terms of interest rates

Conclusions on the use of modelling approach

- Both models have distinct advantages & disadvantages
- As increasing energy prices & discount rates balance each, we recommend to apply the static modelling for simplification reasons
- In case, any of the dynamic variable (e.g. energy prices) are expected to change dramatically, it is better to use the dynamic model

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Conclusions

- Energy efficient appliances are usually more expensive in comparison to equivalent conventional appliances
- But: their operating costs are often lower
- Operating costs are usually not known to consumers and they are not included in the purchase decision
- LCC can be used to put higher purchasing prices/ lower operating costs into a realistic perspective

Thank you for your attention!

Do you have any questions?

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