Competitiveness benefits of energy efficiency: a conceptual framework

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Outline

- Background
- Competitiveness
- Value process mapping
- Contribution of energy performance measures to competitiveness
- Translating competitiveness impacts into financial calculations
- Conclusion

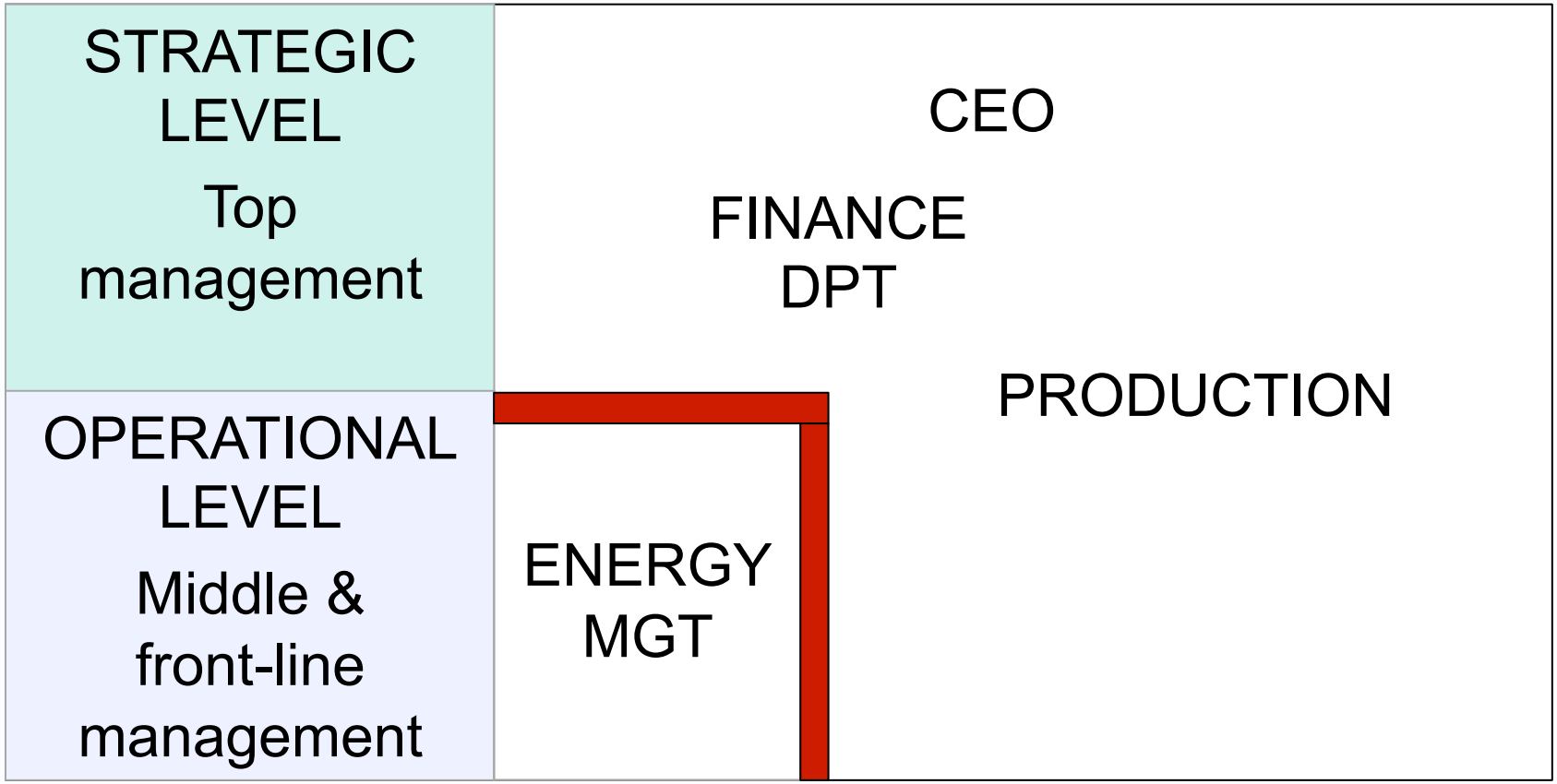
I. Background

Energy-efficiency gap in for-profit companies: Why profitable energy-efficiency investments are not being chosen?

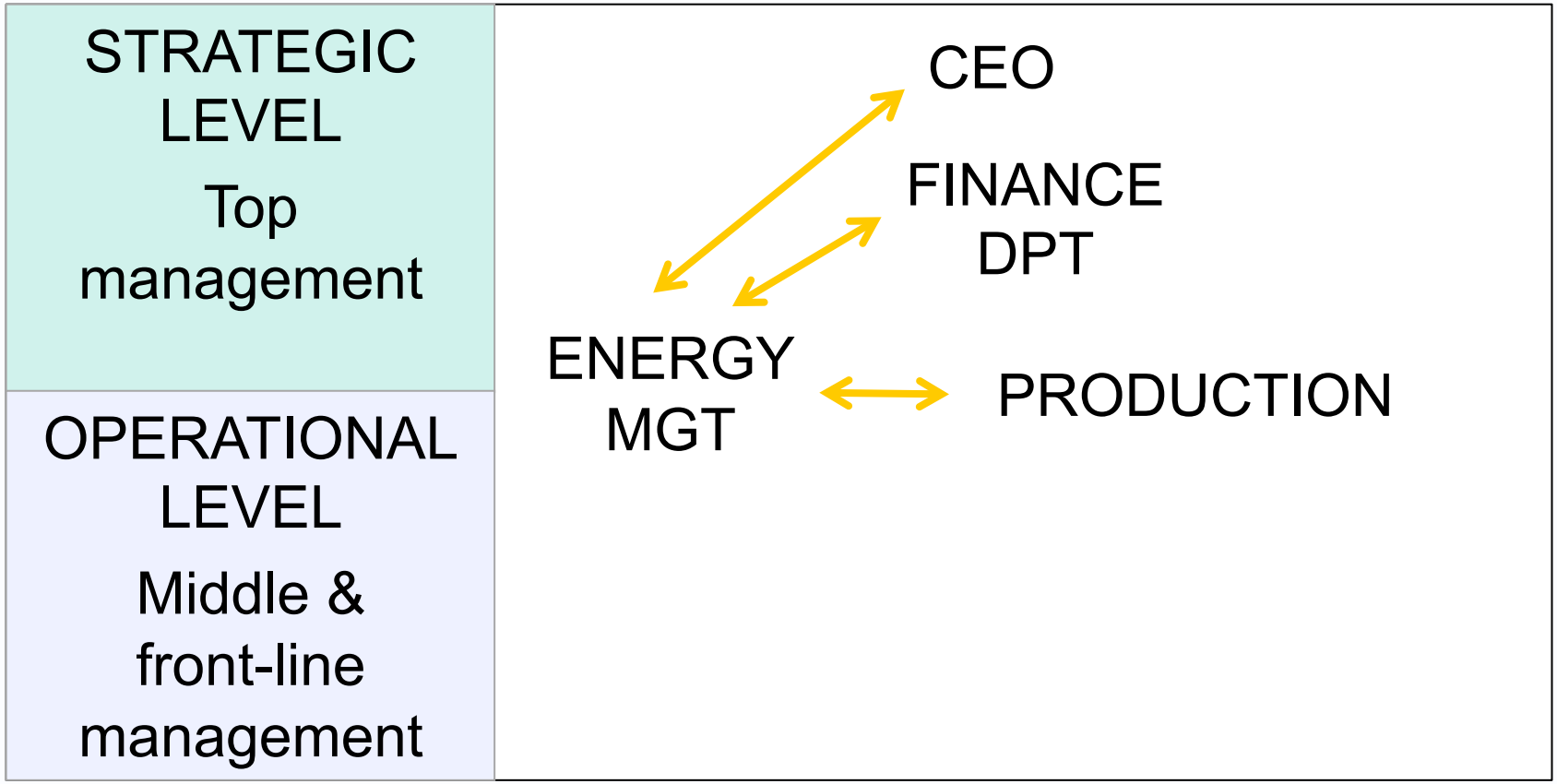
Research finding 1:

- Financial logic not decisive
- Strategic logic (i.e. contribution to competiveness) is more important

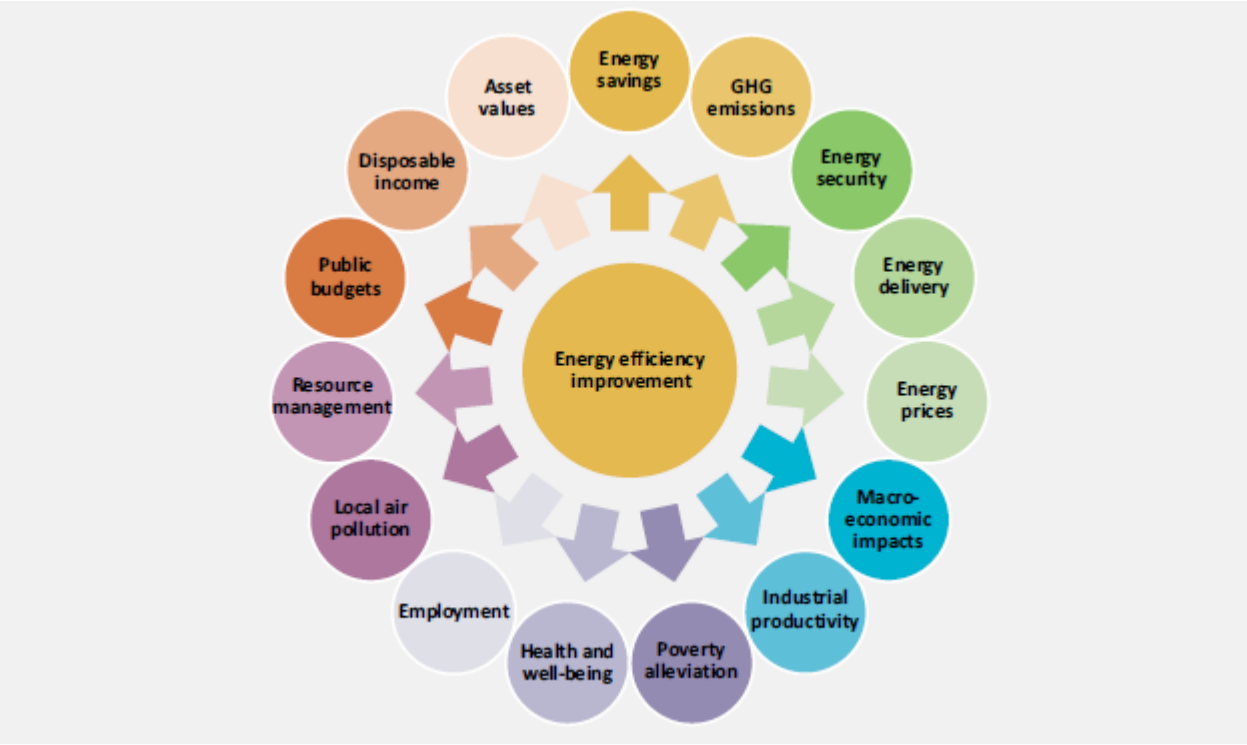
in businesses' investment choices



- Energy is considered non-core business, non-strategic, thus a secondary issue.
- Energy manager has difficulty of access and communication with top management and production.



- To get access to top management, make energy-efficiency investments strategic
- To get access to production management, link operations & energy analyses
- A triple integrated approach is needed: energy-operational-strategic



IEA report, Capturing the multiple benefits of energy-efficiency, Paris, Septembre 2014:

- *Macro-economic impacts*
- *public budget impacts*
- *Health & well-being impacts*
- *Industrial sector impacts*
- *Energy delivery impacts*

Non-energy / multiple benefits :

- Can make energy issues strategic

but

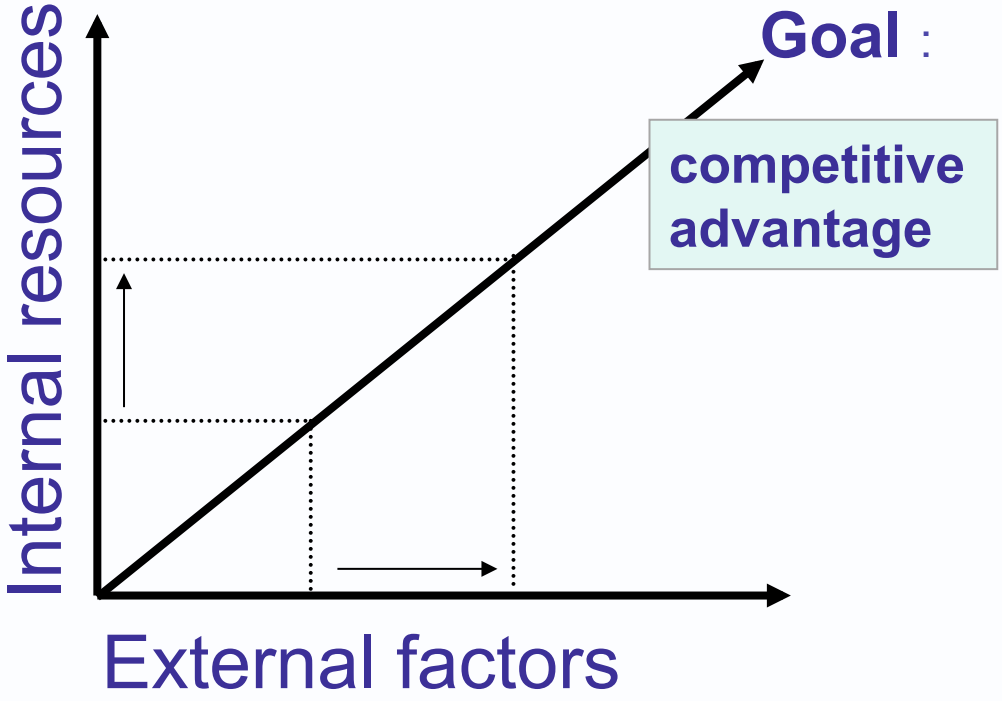
- they have to be analyzed ex ante (i.e. before projects start)
- They have to be communicated in a convincing way to stakeholders

II. Competitiveness

Strategy*:*

a balance between internal resources and external factors in order to build a durable competitive advantage, through resources allocation.

(Johnson & Scholes, 1999)



The 3 dimensions of strategy

Strategy:

a balance between internal resources and external factors in order to build a durable competitive advantage, through resources allocation.

(Johnson & Scholes, 1999)

An investment is strategic if it contributes to create, maintain or develop a sustainable competitive advantage (Cooremans, 2011).

This definition implies that an investment, or an investment decision, is not simply strategic or non-strategic. Strategic decision-making is a continuum, where decisions can be non-strategic, weakly strategic, strongly strategic or totally strategic.

Therefore the “strategicity” of an investment can be assessed. The more strategic an investment the more chances it has to win the competition.

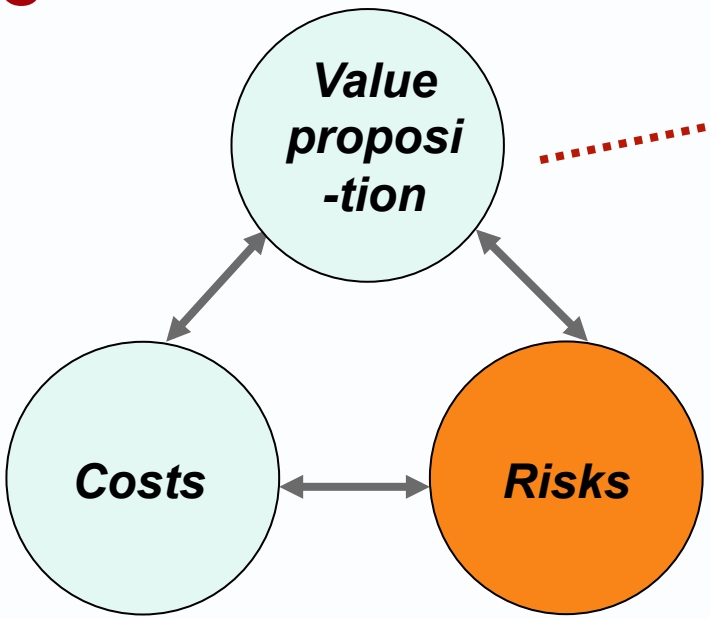
Competitive advantage:

Value proposition first !

“a set of benefits that a product (or a service) promises to deliver”

Kotler, 1999

Competitive advantage



The better the value proposition the higher the turnover /income

Supported to produce and deliver the value proposition

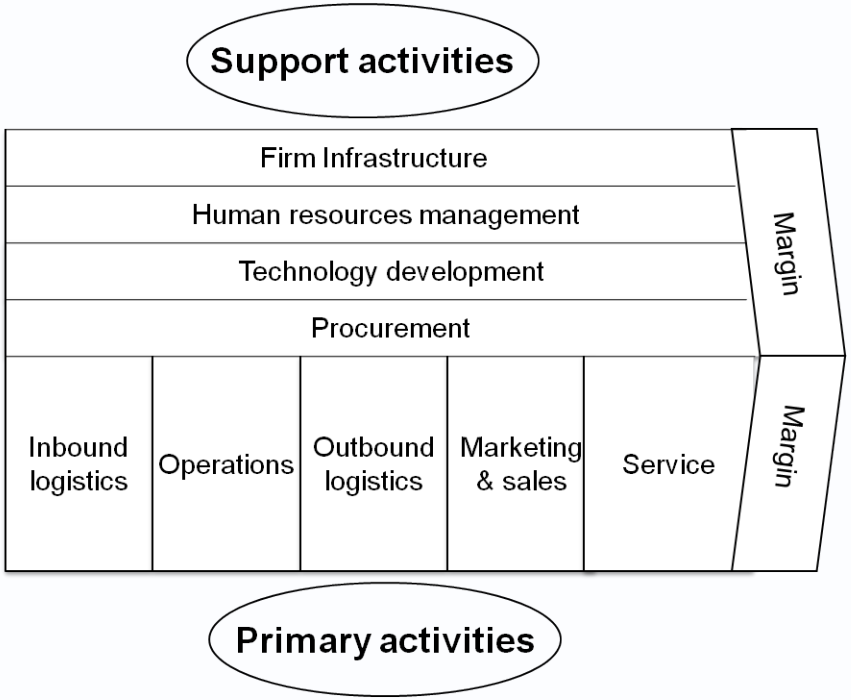
Supported to produce and deliver the value proposition
Risk reduction may have impact on value proposition and / or on costs

The three dimensions of competitive advantage - Cooremans, 2011

III. Value process mapping

The activity-based approach to competitive advantage

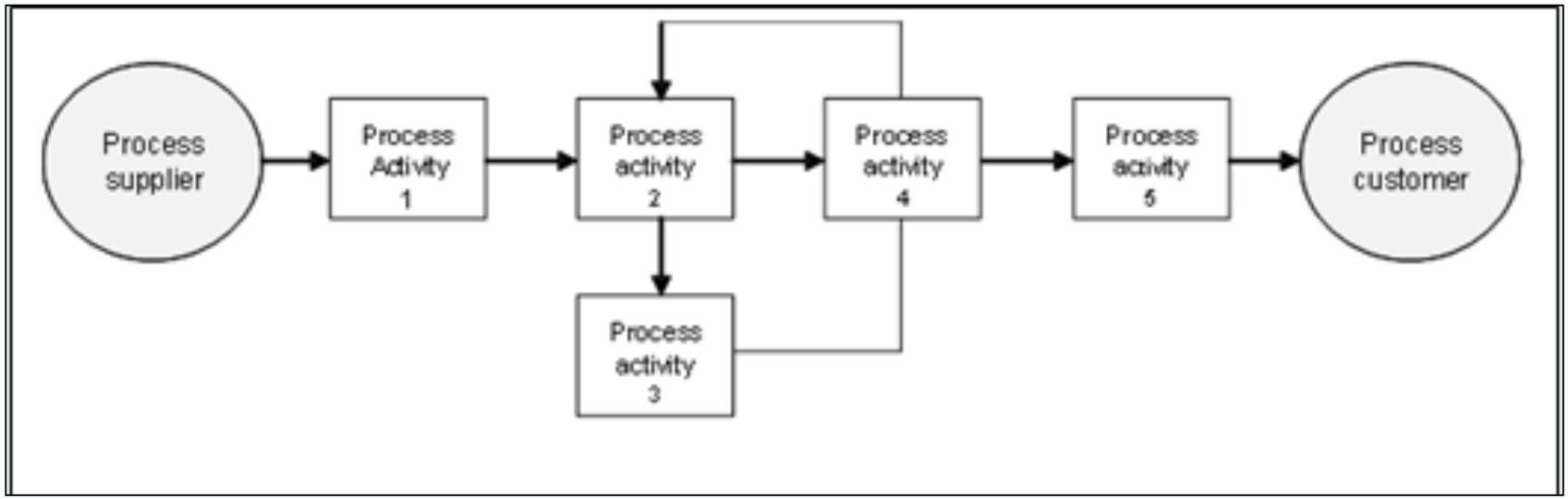
At a firm's level



The Generic Value Chain (Porter, 1985)

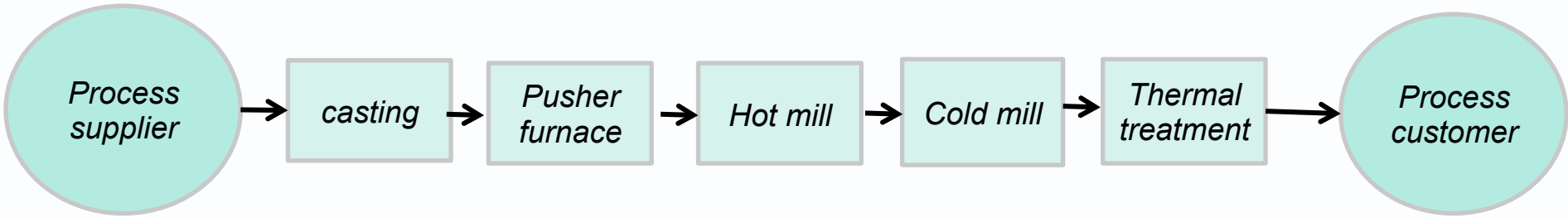
"The **value chain** disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation" (Porter, 1985:37)

At operational level



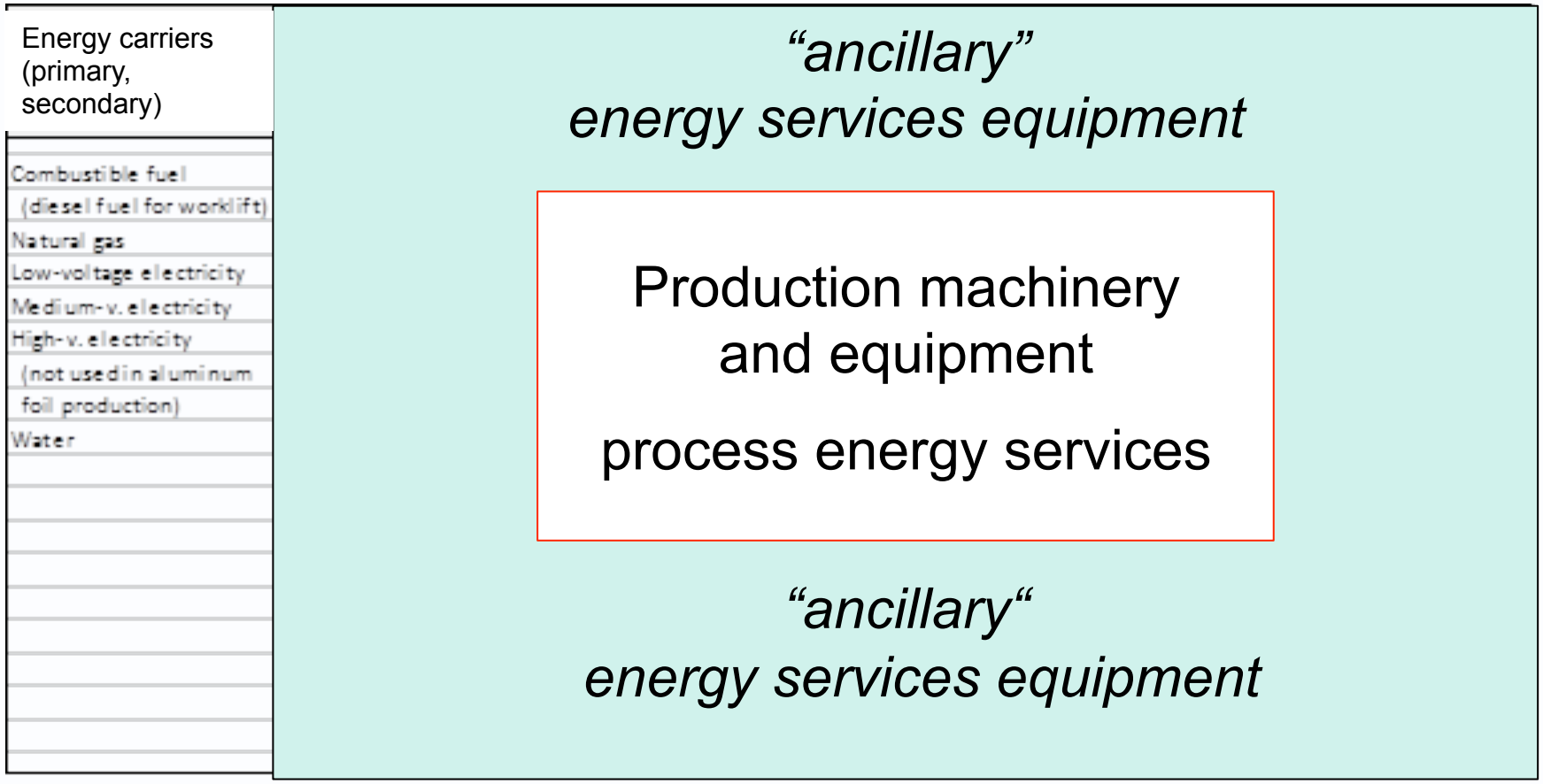
Process mapping (George et al., 2005:40)

Aluminum foil production process map



"Safety is always the priority issue. Secondly, product quality, reliability and energy are other important criteria. For instance, energy is very important in furnaces while on a milling machine, quality and reliability will be favored ".

Mr Germanier, Novelis Switzerland, energy & project manager, 18 mars 2015



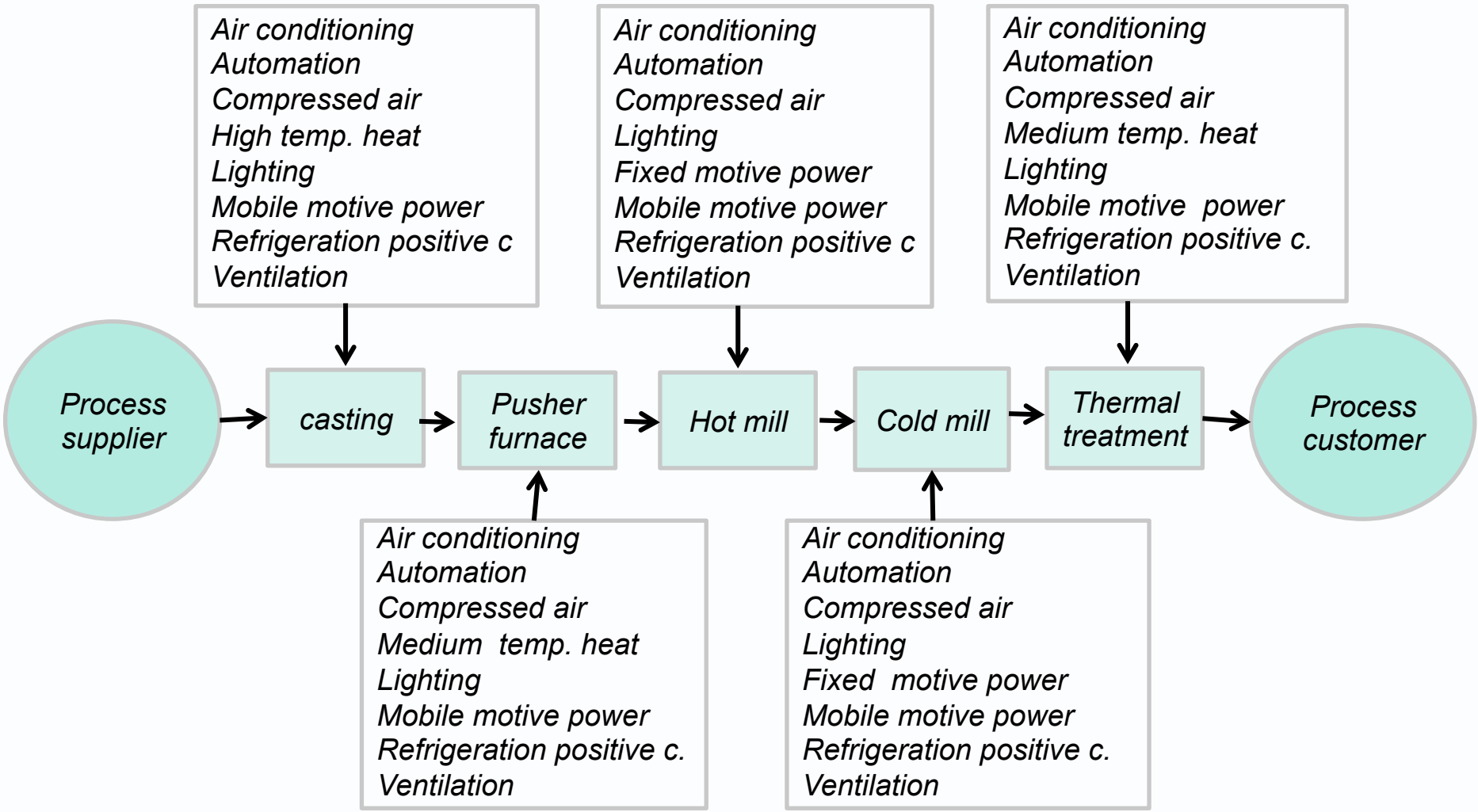
The classical "energy commodity approach":

- Focus on KWh saving
- Focus on equipment and *not* on energy services
- Energy analysis often relegated to "ancillary" equipment

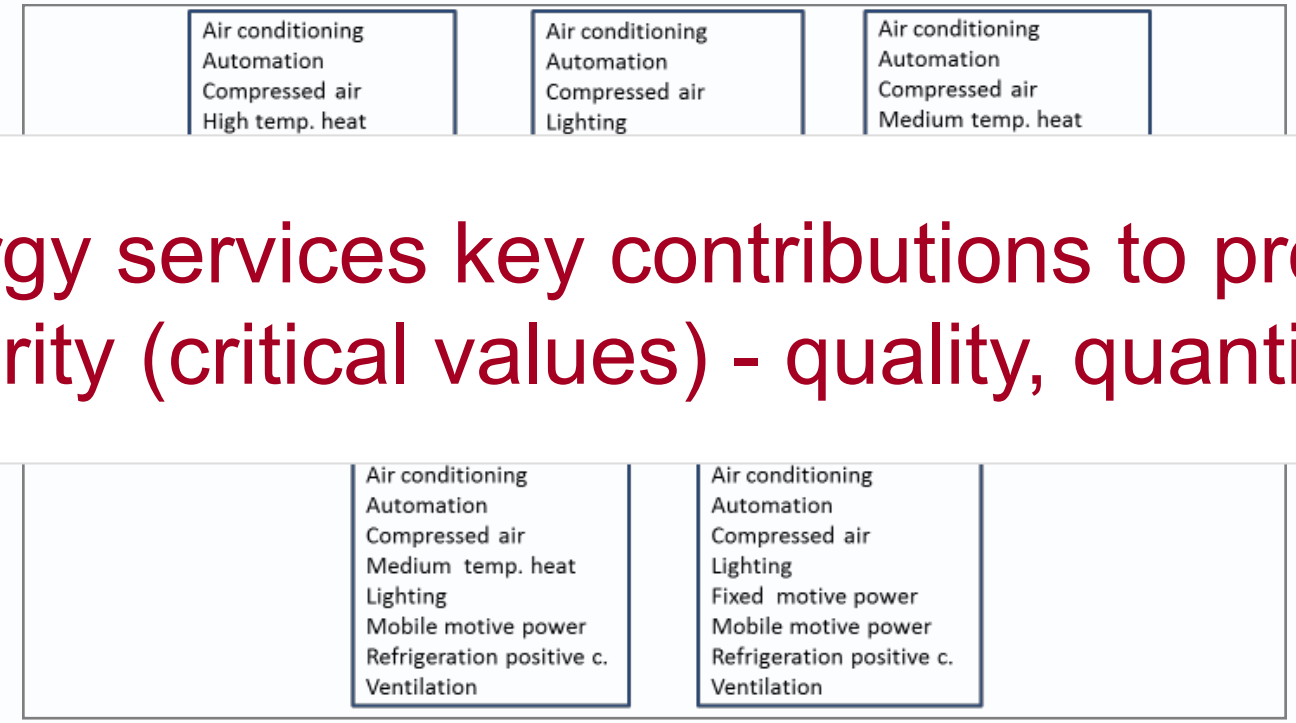
In order to assess an energy-efficiency performance measure taking into account operational, energy and strategic dimensions, the following elements have to be analyzed:

- Security
- Products (goods & services – quantity & quality)
- Time (speed of production process)
- Flexibility
- Consumables (energy carriers, lubricants, etc.)
- energy services
- Waste and emissions (by-products)

Aluminium foil production
process mapping + energy services



Aluminium foil production
process mapping + energy services

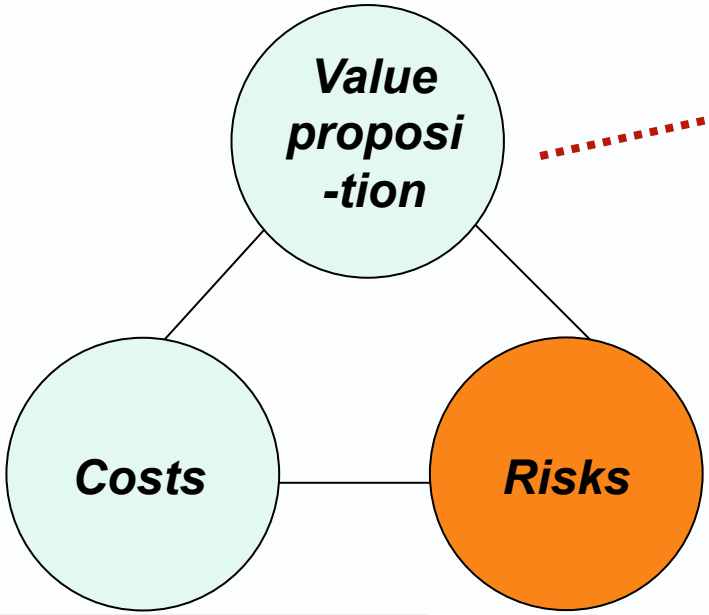


Energy services key contributions to process: security (critical values) - quality, quantity

Integrating energy & operations approaches *erases the line between process energy services and ancillary energy services and opens the door to strategic analysis*

IV. Contribution of energy performance measures to competitiveness

Make it strategic!



- ↑ *Product quality*
- ↑ *Product reliability*
- ↑ *Facilities security*
- *Etc.*

- ↓ *Raw materials*
- ↓ *Maintenance costs*
- ↓ *Equipment oversizing*
- ↓ *product rejection rate*
- ↓ *Insurance premiums*
- ↓ *Energy costs*

- ↓ *Workplace accident risk*
- ↓*Commercial risk*
- ↓ *Equipment breakdown*
- ↓ *Legal risk*
- ↓ *CO2 risk*
- *Etc.*

IV. Translating competitiveness benefits into financial calculations

Once identified, strategic benefits of energy-efficiency projects have to be translated into financial calculations, including NEB

SANTA CLARA UNIVERSITY **Lighting project**	Year 0	**Proj. Year 1**	**Proj. Year 2**	**Proj. Year 3**	**Proj. Year 4**	**Proj. Year 5**
			(% or thousand of USDOL)			
Revenues						
Energy benefits - Financial savings from energy consumption reduction		11'169	11'169	11'169	11'169	11'169
Non-energy benefits 1 - Impact on maintenance		2'366	2'366	2'366	2'366	2'366
Non-energy benefits 2 - ….		0	0	0	0	0
Non-energy benefits 3 - ….		0	0	0	0	0
Total gross revenues		**13'535**	**13'535**	**13'535**	**13'535**	**13'535**
Lamps furniture		**2'700**	**2'700**	**2'700**	**2'700**	**2'700**
Depreciation		850	850	850	0	0
Net income before taxes		9'985	9'985	9'985	10'835	10'835
Taxes		2'396	2'396	2'396	2'600	2'600
Net income after taxes		7'589	7'589	7'589	8'235	8'235
Depreciation		850	850	850	0	0
Net income		**8'439**	**8'439**	**8'439**	**8'235**	**8'235**

SANTA CLARA UNIVERSITY Lighting project		Year 0	Proj. Year 1	Proj. Year 2	Proj. Year 3	Proj. Year 4	Proj. Year 5
			(% or thousand of USDOL)				
Net income			8'439	8'439	8'439	8'235	8'235
Capital expenditure		2'550	0	0	0	0	0
Terminal value before taxes			0	0	0	0	0
Terminal value after taxes			0	0	0	0	0
Free Cash-Flows		-2'550	**8'439**	**8'439**	**8'439**	**8'235**	**8'235**
NPV (NET PRESENT VALUE)							
15%	**11'169**						
9%	**29'996**						
5%	**33'657**						
IRR (INTERNAL RATE OF RETURN)	311%						
PAY-BACK TIME	0.30						

Conclusion

A comprehensive analysis to build up the business case of energy-efficiency investment projects by integrating the multiple benefits of energy-efficiency

SANTA CLARA UNIVERSITY Lighting project		
Net income		
Capital expenditure		
Terminal value before taxes		
Terminal value after taxes		
Free Cash-Flows		
NPV (NET PRESENT VALUE)		
	15%	**11'169**
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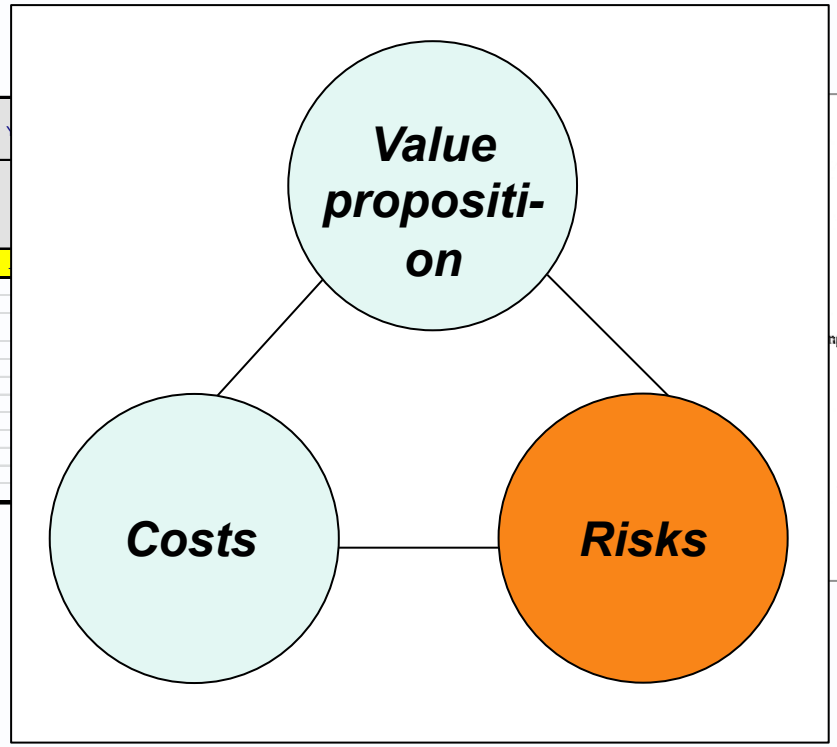
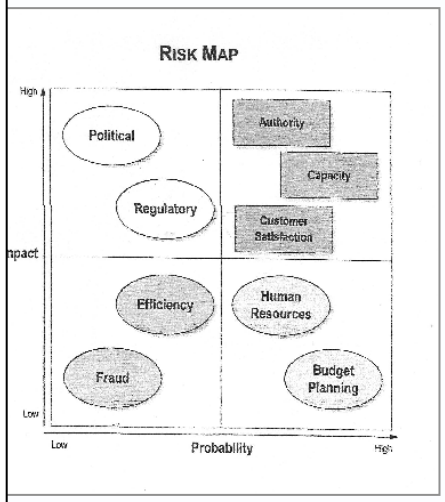
IRR (INTERNAL RATE OF RETURN)		311%
PAY-BACK TIME		0.30

Financial analysis



Strategicity



Risk analysis

Conclusion

an analytical tool capable of:

- Translating any technical investment project into strategic terms
- Bridging and unifying the languages of strategy and finance
- Being applied to any industry or company

Thank you for your attention

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