

CAPTURING THE MULTIPLE BENEFITS OF ENERGY EFFICIENCY

IEA Roundtable on Industrial Productivity & Competitiveness Impact

**Categorizing
non-energy benefits
of energy efficiency
in strategic terms
in order to boost
investment**

Catherine Cooremans
MBA, PhD



CONTEXT

Context - Investment decision-making

Research finding 1:

- Financial logic not decisive
- Strategic logic more important in businesses' investment choices

Research finding 2:

- A huge diversity is observed between companies' situations and behaviors
- even within the same industry

Context - Investment decision-making

An analytical tool is needed, capable to:

- Translate any investment project in strategic terms
- Bridging and unifying strategy and finance languages
- Apply to any industry or company

CONCEPTUAL FRAMEWORK

Conceptual framework

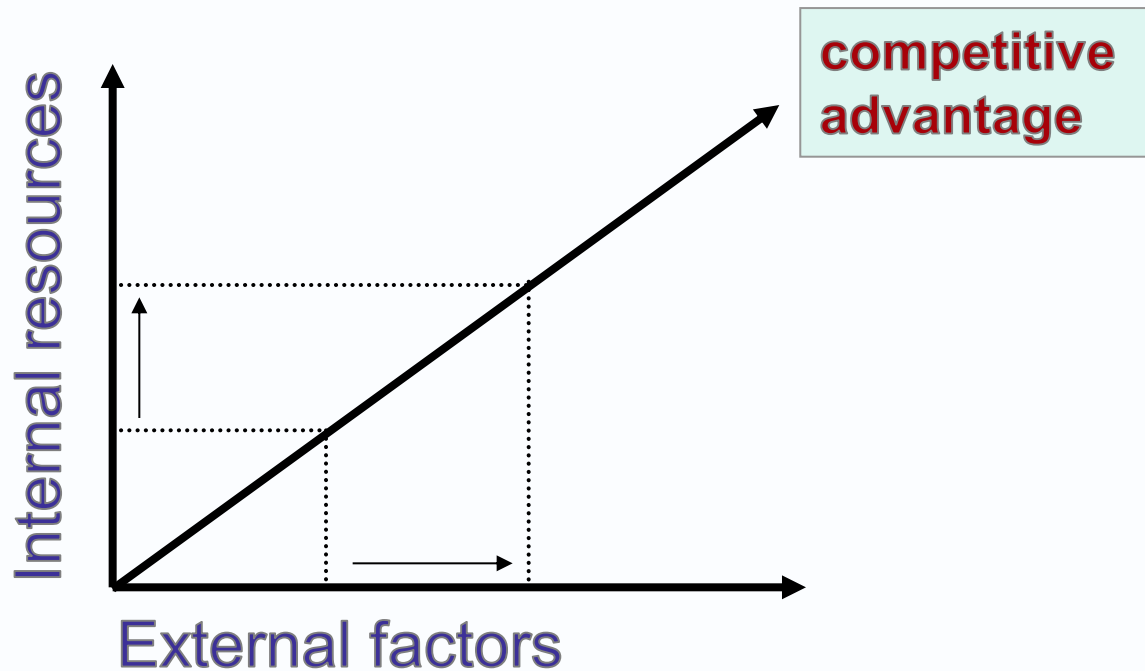
Definitions:

- An **investment is strategic** if it contributes to create, maintain or develop a sustainable competitive advantage (Cooremans, 2011)
- **Competitive advantage** is a three-dimensional concept, formed of three inter-related constituents: value, costs and risks (Porter, 1985; Cooremans, 2011)

Conceptual framework

Two theoretical approaches on the sources of competitive advantage:

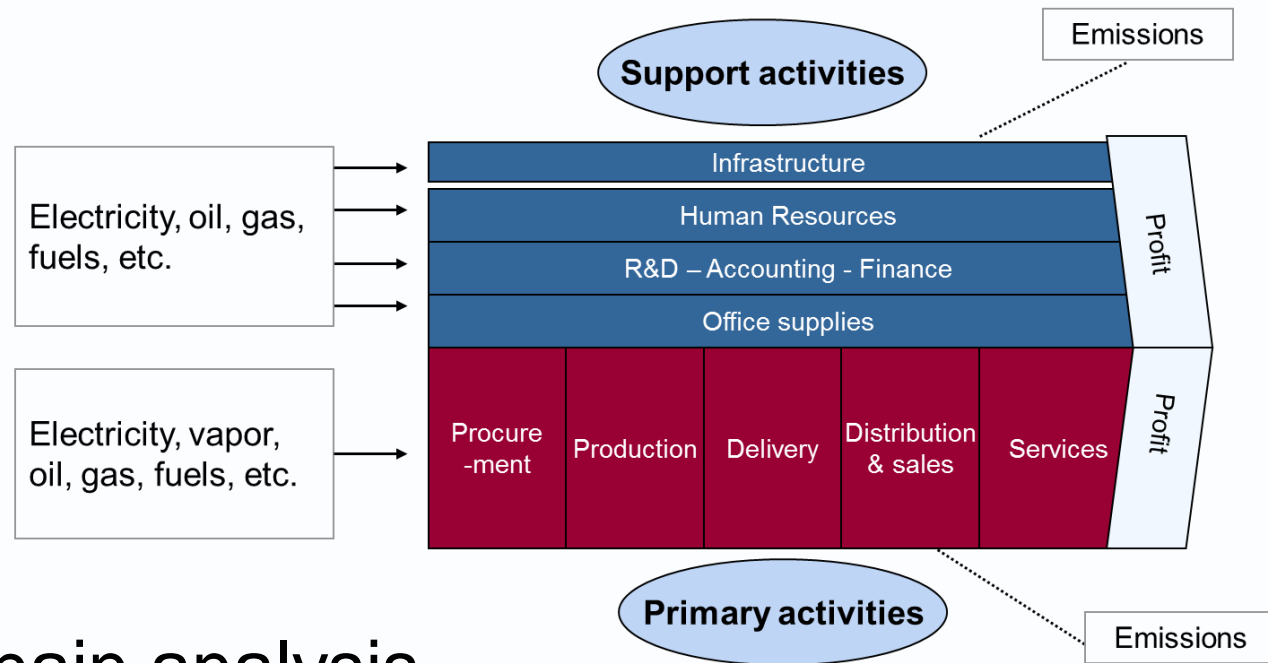
- Resource-Based View (RBV) approach



Conceptual framework

Two theoretical approaches on the sources of competitive advantage:

- Activities approach

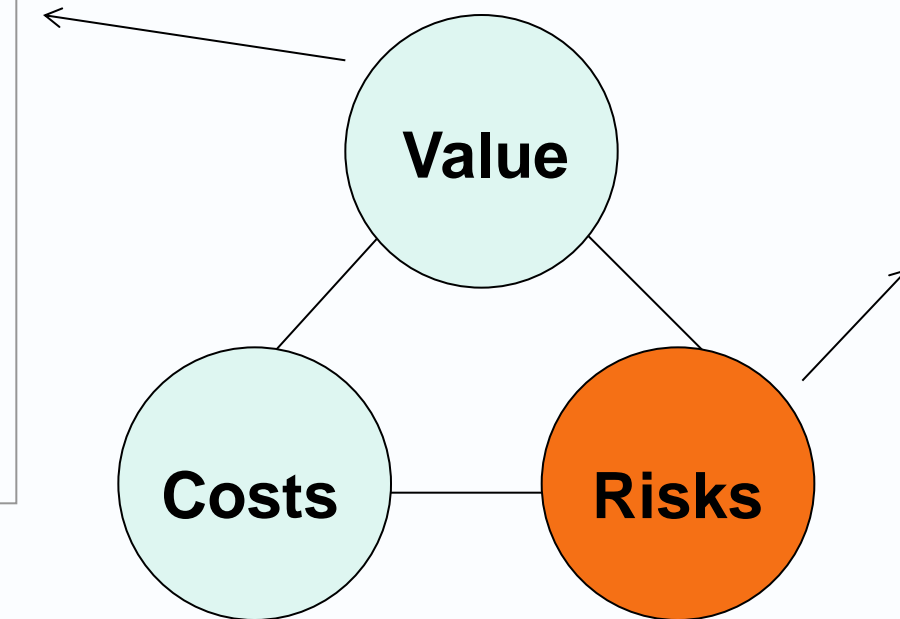


The value chain analysis (Porter, 1987)

Conceptual framework

- = value
a firm is able to create for its customers
- The higher the value the higher the sales

Measuring strategicity



supported to create and deliver the value proposal

Supported to create and deliver the value proposal

3 dimensions of competitive advantage

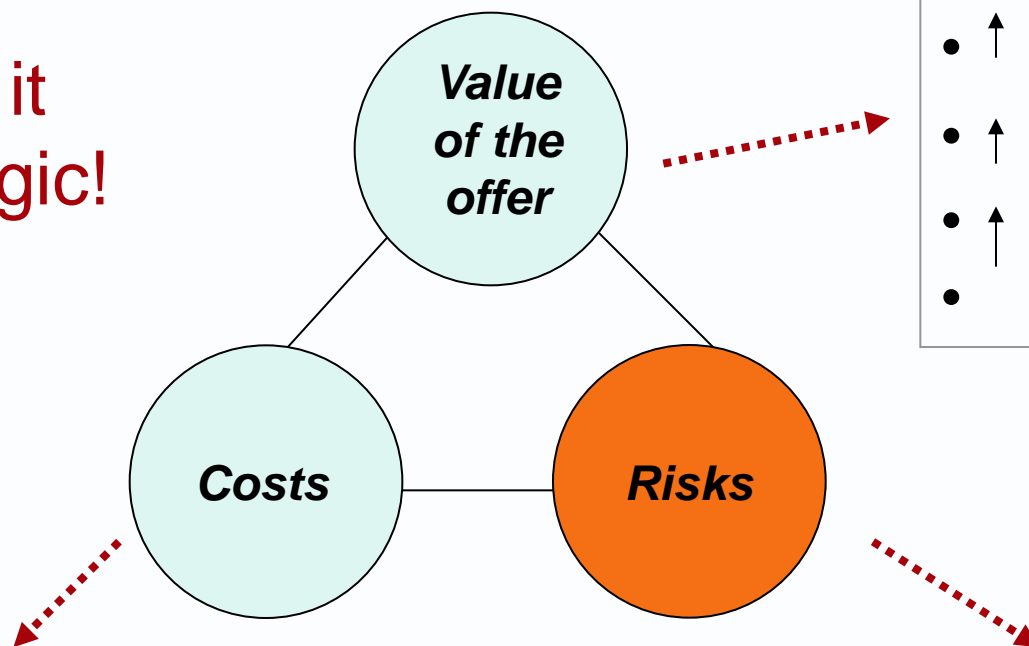
For many companies, strategic advantage is based on a “superior value” stemming from providing unique benefits and not for offering lower prices.

As emphasized by Michael Porter:

“value, instead of cost, must be used to assess competitive position since firms often deliberately raise their cost in order to command a premium price via differentiation” (Porter, 1985:38).

Influencing investment decision-making

Make it strategic!



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

- ↓ *Raw materials*
- ↓ *Maintenance costs*
- ↓ *Equipment oversizing*
- ↑ *Employees' loyalty*
- *Etc.*

- ↓ *Commercial risk*
- ↓ *Equipment breakdown*
- ↓ *Legal risks*
- *Etc.*

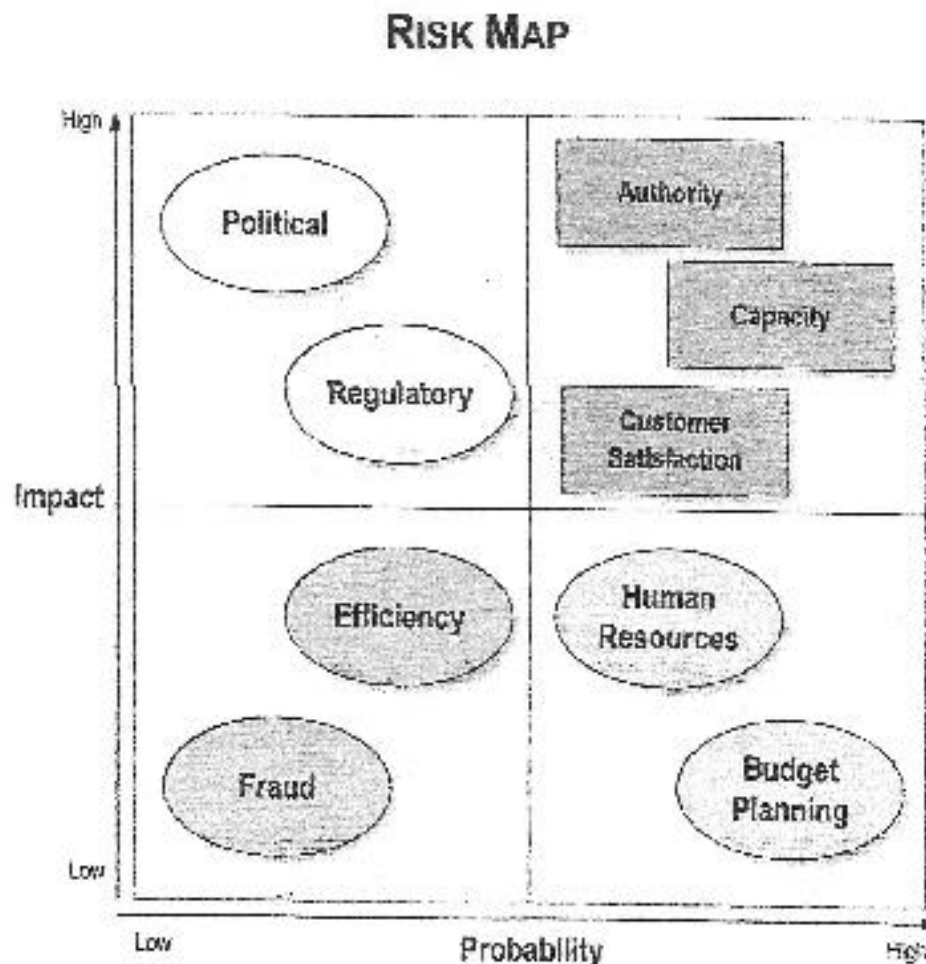
Conceptual framework

This competitive advantage analytical tool enables to:

- Take into account not only cost reductions but also a possible **increase in sales** (higher quantity and/or price premium)
- Take into account **risk** (qualitative analysis)
- Translate the **strategic benefits** of energy-efficiency projects into **financial calculations**

Conceptual framework

Bridging
strategic
analysis
with
risk analysis
(qualitative):



Source: Fragnière, E., *Risk Management*, 2007, p. 38

Conceptual framework

Bridging strategicity with financial analysis (quantitative):

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

Conceptual framework

Bridging strategicity with financial analysis (quantitative):

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					

Project	Metal alloy industry Oven change								
	Category of benefits	Strategic Benefit	Evaluating strategicity: contribution of the project to value increase, risks decrease & cost decrease						TOTAL max. = 15 for each line
			Impact on value	-5 → +5	Impact on risk	-5 → +5	Impact on cost	-5 → +5	
Production	Production improvements	yes	3	yes	3	yes	3	9	
	Product quality	yes	4	yes	1	yes	4	9	
	Product reliability	yes	4	yes	3	yes	4	11	
	Plant capital	no	0	yes	1	yes	1	2	
Operation & Maintenance	Maintenance labor costs	no	0	no	0	yes	2	2	
Working Environment	Site Environmental quality	yes	2	X	2	--	1	5	
	Worker health & safety	no	0	yes	5	yes	2	7	
	Worker loyalty	yes	2	yes	4	yes	3	9	
Corporate brand	Reputation & image	yes	4	yes	3	yes	0	7	
Environmental	Local or regional emissions	yes	4	yes	4	yes	2	10	
NB: "yes" means impact, which can be negative (from -5 to -1) or positive (from 1 to 5) - "no" means no impact									

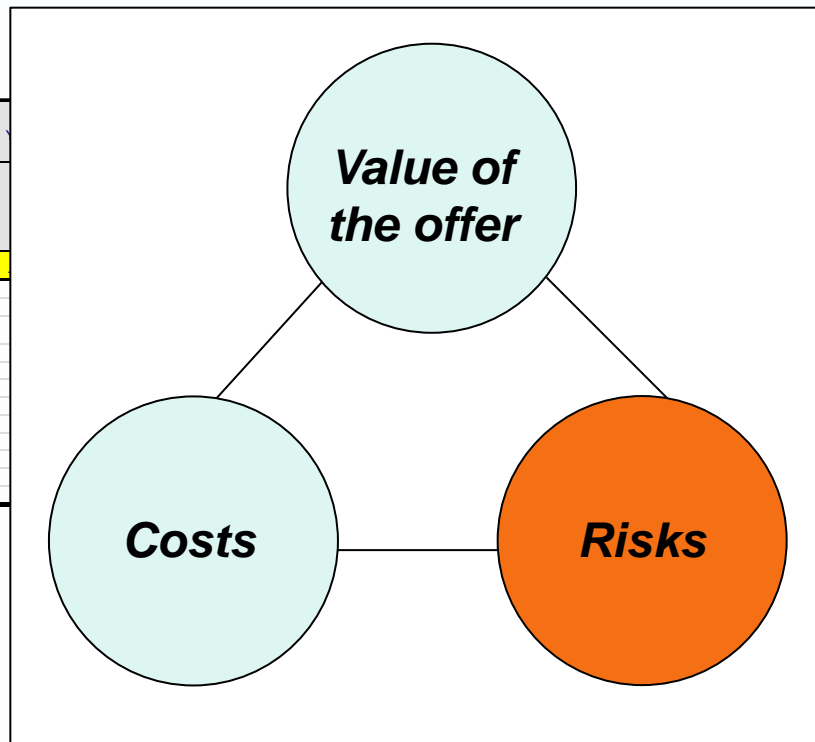
Evaluating contribution to competitive advantage: example

Conclusion

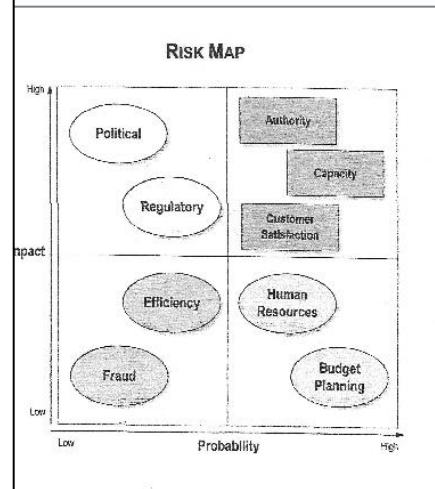
A comprehensive analysis to build up the business case of energy-efficiency investment projects

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
	9%	29'996
	5%	33'657
IRR (INTERNAL RATE OF RETURN)		311%
PAY-BACK TIME		0.30

Quantitative analysis



Strategicity



Qualitative analysis

Conclusion

A triple approach is needed to positively influence firms' energy-efficiency investment decision-making:

- **Customized**: < firms diversity.
- **Systemic**: develop energy-efficiency culture at organization level – Energy management.
- **Strategic**: make it strategic!