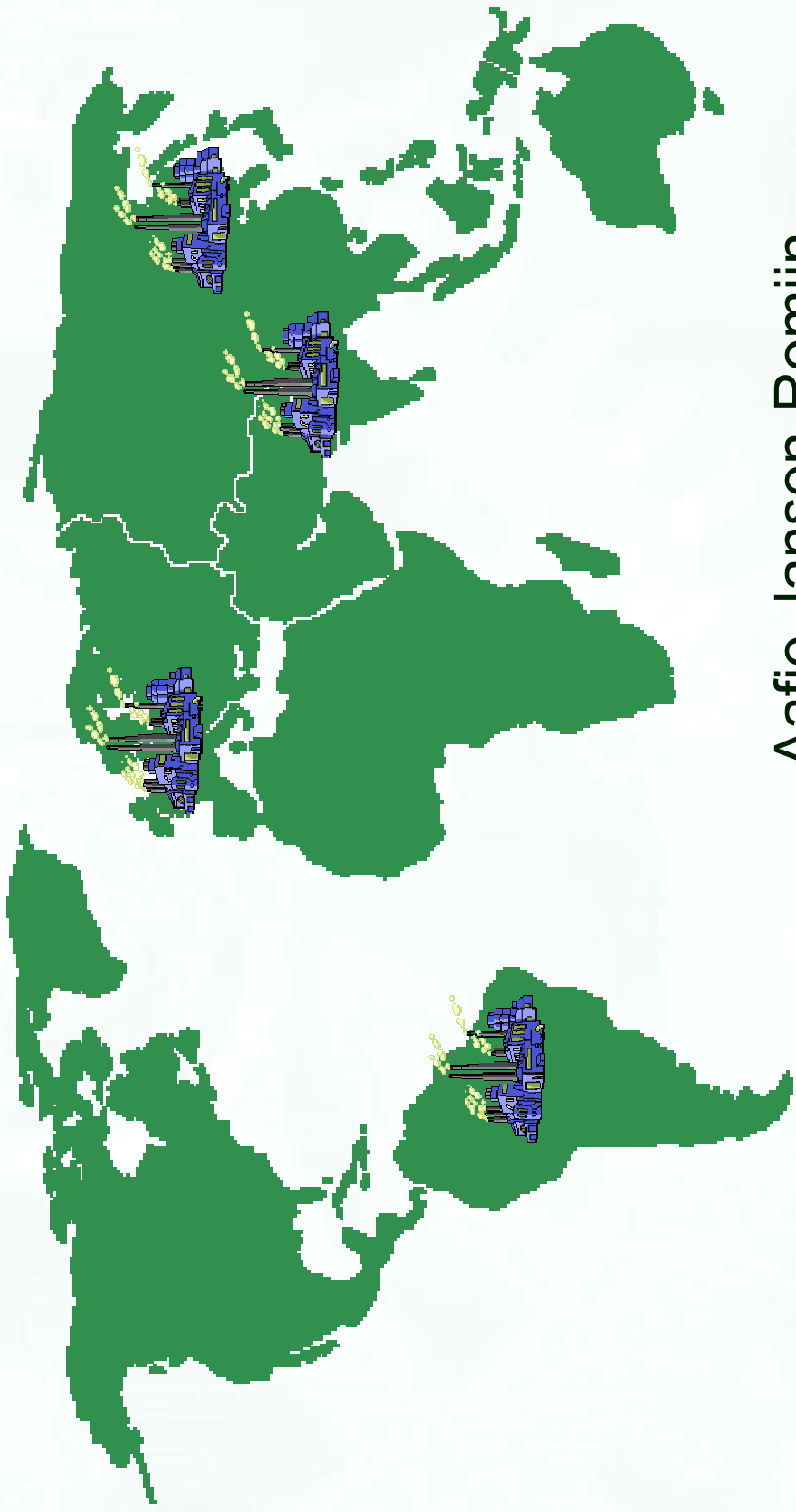


# How to perform a Location Factor Survey



Aafje Jansen-Romijn  
Cost Engineering Consultancy<sub>1</sub>

# What is a location factor?

## **Definition:**

An overall total project factor for translating all of the project cost elements of a defined construction project scope of work from one geographic location to another.

# Location factors

## Capital investment ratio for:

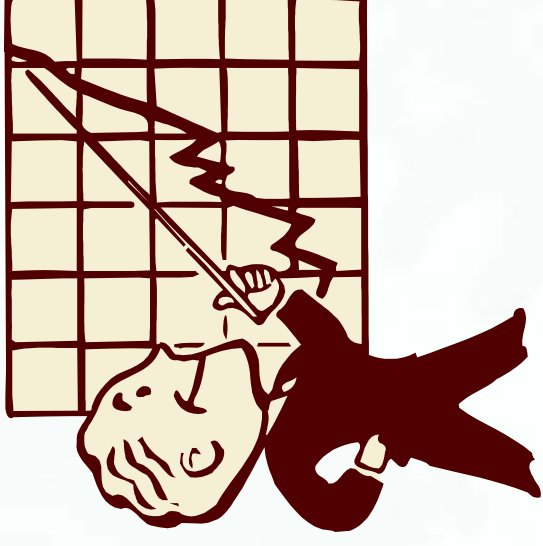
- Identical plants
- Built at the same time
- At different locations

## Identical for :

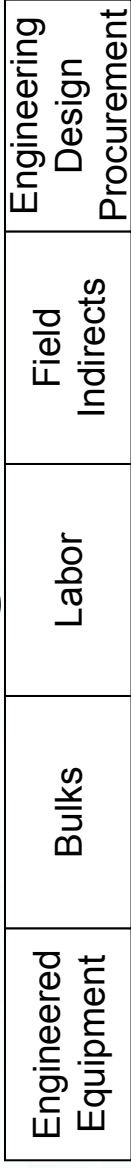
- Plant capacity
- Process
- Design
- Circumstances

# Location factor survey should recognize differences in:

- Productivity
- Cost for
  - Labour
  - Engineered equipment
  - Commodities
- Freight/duties/taxes
- Engineering/design/procurement/project administration



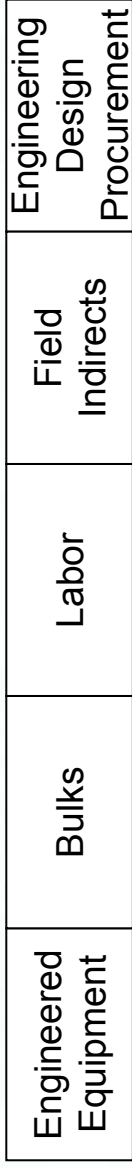
# Factoring Method



**Base Location**

versus

versus



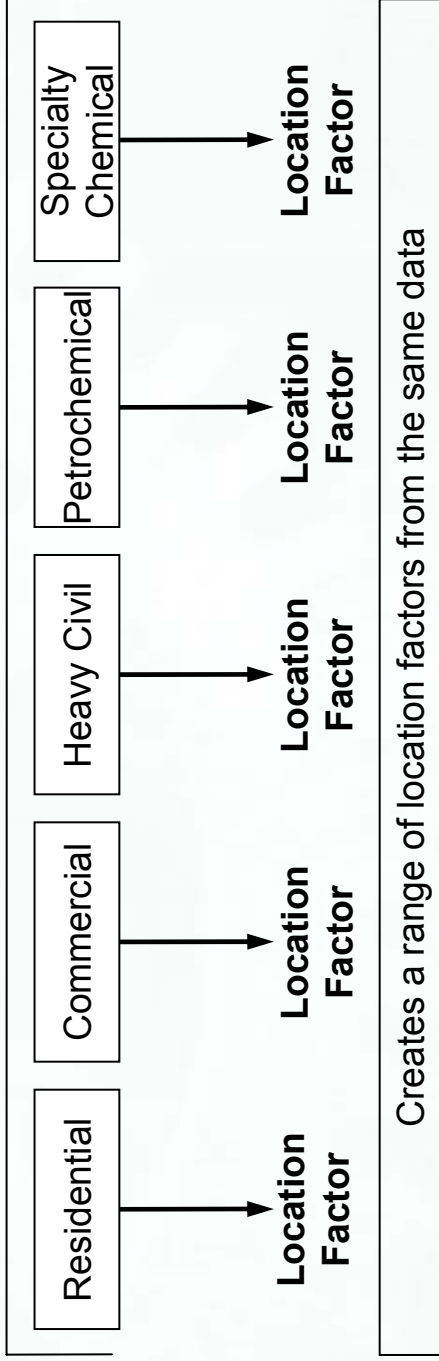
**Foreign Location**

Factors and Percentages

%

%

Applied to a broad spectrum of estimates



Creates a range of location factors from the same data

# Location factoring method

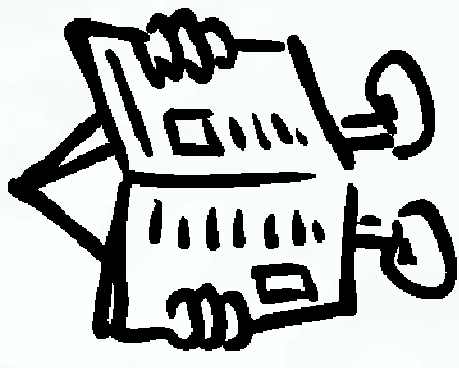
## Requirements

Detail survey of

- Labour
- Materials
- Equipment
- Project specific costs

# Information sources

- Local engineering offices
- Local construction contractors
- Netherlands Business Support Offices
- Economische voorlichtingsdienst
- Real-estate agents
- Country specific info from e.g. CIA
- Economic studies from e.g:
  - Economist Intelligence Unit
  - Database Cost Engineering
  - University: Phd-/Master-thesis
  - Internet; etc..



# Location factoring Structuring

For mutual understanding the survey must be

- organized
- structured
- and worded

in such way that all parties understand exactly what is requested.

**Therefor: Market Baskets en Cost Elements**



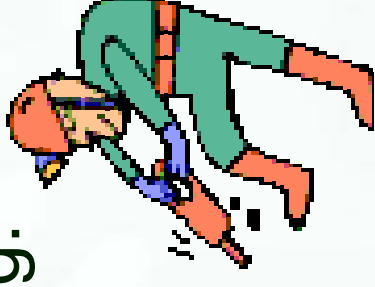
# Market baskets

## Examples

- Land/site development
- Buildings
- Engineered equipment
- Bulk materials
- Construction Labour
- Field indirects
- Engineering/Design/Procurement

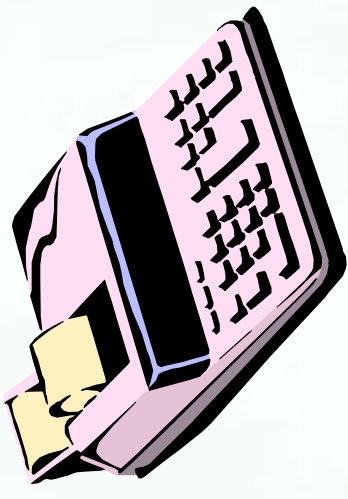
# Location factoring method in a nutshell (1 of 2):

- Select a detailed estimate or scope for the base case location
- Split estimate in market baskets
- Determine basic costs elements
- Create parallel estimate by applying:
  - ✓ Overseas labour costs or factors
  - ✓ Material costs or factors
  - ✓ Equipment costs or factorsto the base case estimate



# Location factoring method in a nutshell (2 of 2):

- Calculate allowances for:
  - Taxes&fees
  - import duties
  - Freight
  - Etc
- Determine:
  - Indirect project costs: global vs local



# Owner specific data/requirements:

## Data needed from owner:

- Base case scope and estimate
- Global vs Local
- Base currency (e.g. Euro's)
- Targeted location information and boundary conditions
- Operational information, scope and cost
- Personnel needed



# Approach CEC: market baskets

Aggregated Market Basket Location Factors

Scope	Denmark		China		Price ratio China versus Denmark on Okt06		Investment on Okt'06 in DKK		Investment on Okt'06 in DKK	
	Price info on Okt06 in DKK	Cost-index on Okt06	Price info on Okt06 in CNY	Cost-index on Okt06	Price info on Okt06 GNY	Price info on Okt06 DKK	Price info on Okt06 Avg	Denmark		China
<b>Total Buildings</b>										
								51,398.000	1,00	51,398.000
<b>Offices</b>										
312	Shell	4.000	100	5.858	4.000	1,00	4.000			
312	Cladding	2.000	100	2.929	2.000	1,00	2.000			
312	Sanitary & Electrical	3.000	100	4.393	3.000	1,00	3.000			
		1.000	1.000	1.464	1.000	1,00	1.000			
<b>World market</b>										
										1,00
<b>Social area's</b>										
300	Shell	4.000	100	5.858	4.000	1,00	4.000			
300	Cladding	2.000	100	2.929	2.000	1,00	2.000			
300	Sanitary & Electrical	3.000	100	4.393	3.000	1,00	3.000			
		1.000	1.000	1.464	1.000	1,00	1.000			
<b>World market</b>										
										1,00

Local Market represents the project scope and gives the 'weight' of an item within the Location Factor of the group.

The Total Investment of that group for the base location (=Denmark) which is the basis for estimating the Investment costs for chosen site.

Detailed 'Group' Location Factors

# Approach CEC: summary LF-sheet

Aggregated Market Basket  
Location Factors

## Summary

Description	Investment on Okt'06 in DKK		
	Denmark	Factor	China
Land	16.000.000	1,00	16.000.000
Buildings	51.398.000	1,00	51.398.000
Engineered equipment - fermentation	9.590.000	1,00	9.590.000
Engineered equipment - purification			
Engineered equipment - recovery			
Bulk materials			
Construction Labour			
Engineering, design and procurement			
<b>Subtotal</b>	<b>76.988.000</b>	<b>1,00</b>	<b>76.988.000</b>
<b>Project Management</b>			
<b>Engineering Consultancy</b>			
<b>Validation</b>			
<b>Construction Supervision</b>			
<b>Total</b>	<b>76.988.000</b>	<b>1,00</b>	<b>76.988.000</b>

Example

Aggregated Site Location  
Factors

# Evaluate investments on: market basket level

Scope		Denmark				China				Price ratio		Investment on Okt06			
		Price info on Okt06 in DKK		Cost-index on Okt06		Price info on Okt06 in CNY		Cost-index on Okt06		Price info on Okt06		China versus Denmark on Okt06	Denmark	China	
		on Okt06 in DKK	on Okt06 in DKK	on Okt06	on Okt06	on Okt06 in CNY	on Okt06 in CNY	on Okt06	on Okt06	CNY	DKK	Avg	Factor	Factor	
<b>Total Buildings</b>												<b>51.398.000</b>	<b>1,00</b>	<b>51.398.000</b>	
<b>Offices</b>		<b>Local market</b>				<b>World market</b>									
Area [m <sup>2</sup> ]	312	4.000	4.000	100	100	5.858	4.000	1,00	1,00	5.858	4.000	1,00	3.120.000	1,00	3.120.000
	312	2.000	2.000	100	100	2.929	2.000	1,00	1,00	2.929	2.000	1,00			
	312	3.000	3.000	100	100	4.393	3.000	1,00	1,00	4.393	3.000	1,00			
	312	1.000	1.000	100	100	1.464	1.000	1,00	1,00	1.464	1.000	1,00			
<b>Social area's</b>		<b>Local market</b>				<b>World market</b>									
Area [m <sup>2</sup> ]	300	4.000	4.000	100	100	5.858	4.000	1,00	1,00	5.858	4.000	1,00	2.400.000	1,00	2.400.000
	300	2.000	2.000	100	100	2.929	2.000	1,00	1,00	2.929	2.000	1,00			
	300	3.000	3.000	100	100	4.393	3.000	1,00	1,00	4.393	3.000	1,00			
	300	1.000	1.000	100	100	1.464	1.000	1,00	1,00	1.464	1.000	1,00			
		<b>World market</b>				<b>World market</b>									
												<b>1,00</b>			

Update Investment Costs for base location.

# Evaluate investments on: summary LF-sheet

## Summary

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<b>Total</b>	<b>76.988.000</b>	<b>1,00</b>	<b>76.988.000</b>

Update Investment Costs for base location.



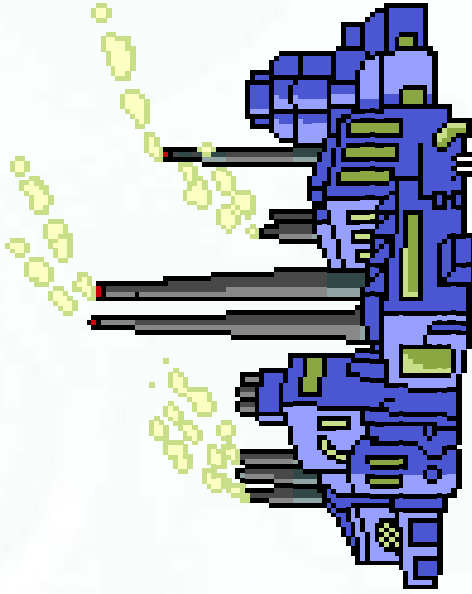
# Qualitative information

(so-called soft info)

## Added value to Location Factor Survey:

- Country information
- Formulate risks per country (qualitative)
- Formulate pro's and con's
- Sensibility analysis (influence of a factor, with all things equal)
- Risk analysis (overall risk, based on range per item)

Finally.....





**COST ENGINEERING**  
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**COST ENGINEERING**  
SOFTWARE



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