

# **Problem Demarcation**



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# Problem demarcation

*How to proceed?*

1. Starting point
2. Means-ends analysis
3. Several problem statements
4. Objectives trees + System boundaries
5. Compare & Choose

1. Choose one issue as a starting point

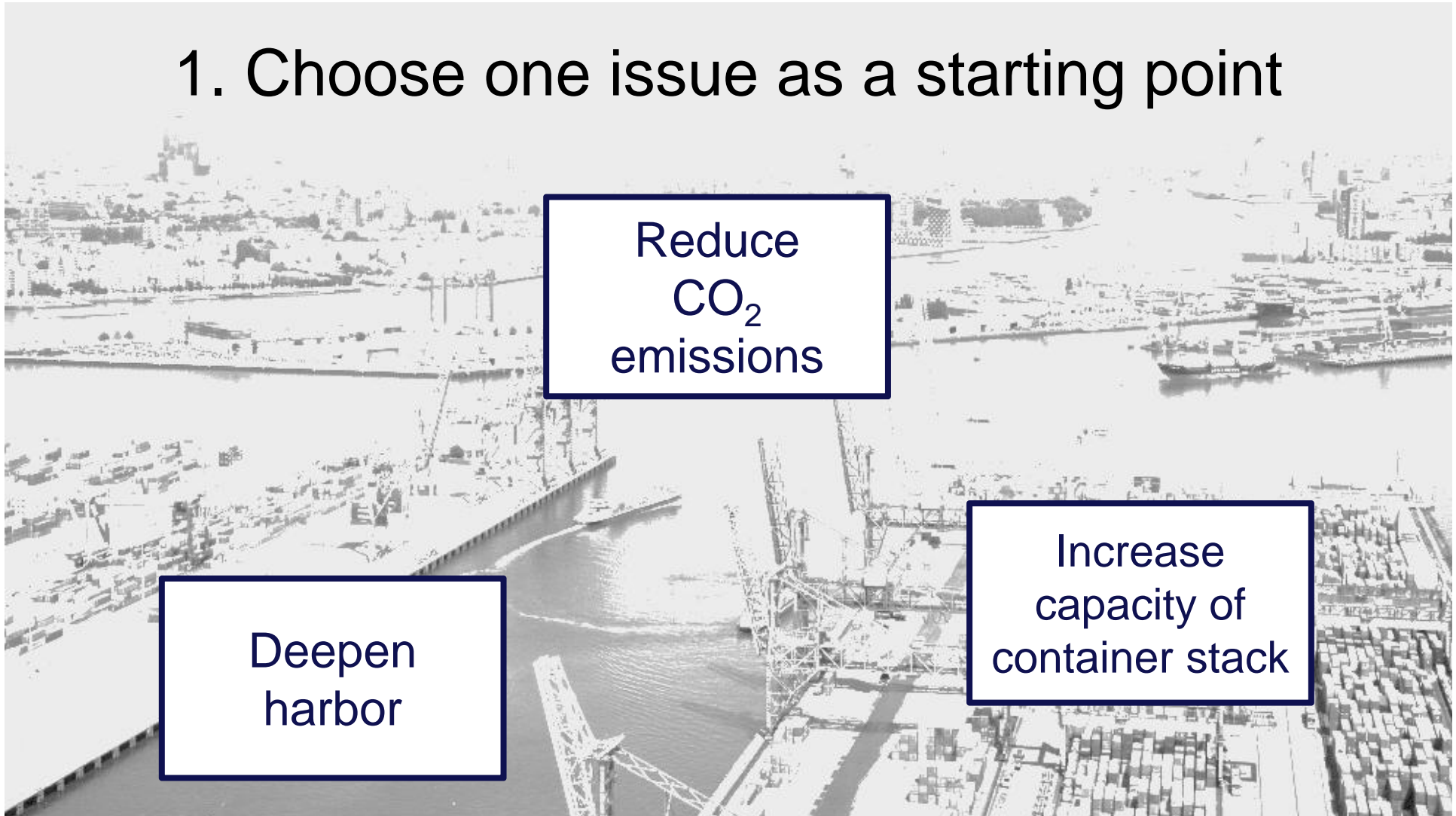


# 1. Choose one issue as a starting point

Reduce  
CO<sub>2</sub>  
emissions

Deepen  
harbor

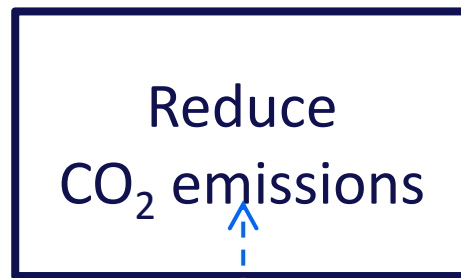
Increase  
capacity of  
container stack





## 2. Perform a means-ends analysis

*“means-ends box”*



*a single verb phrase*

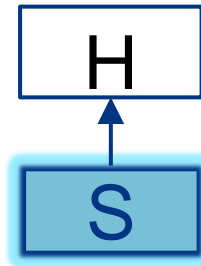
*Why?*



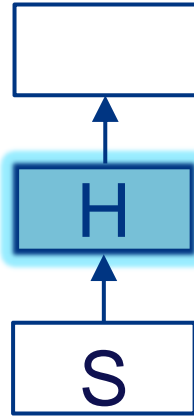
Reduce  
CO<sub>2</sub> emissions

*How?*

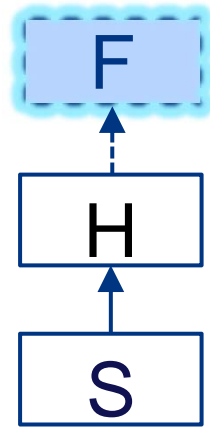




*Why?*

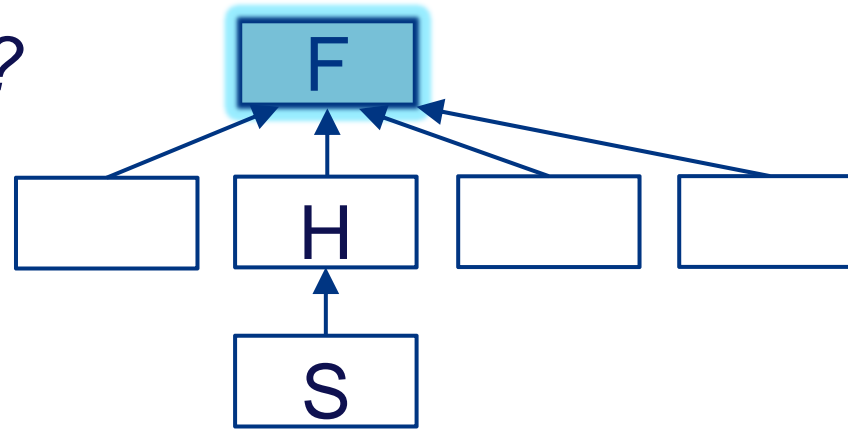


*Why?*

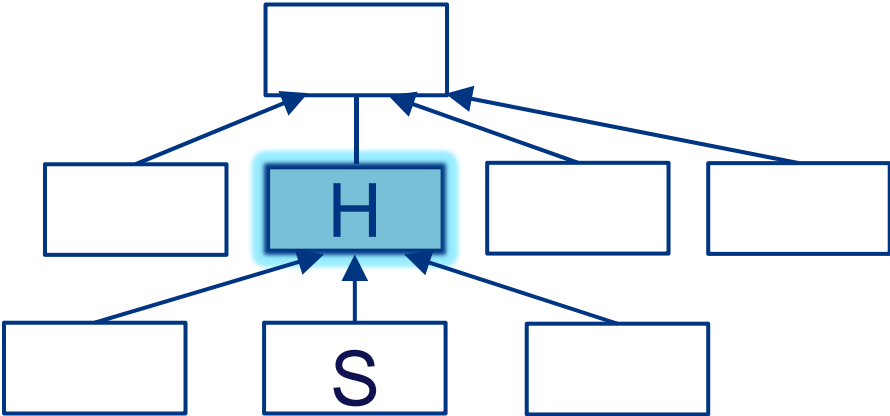


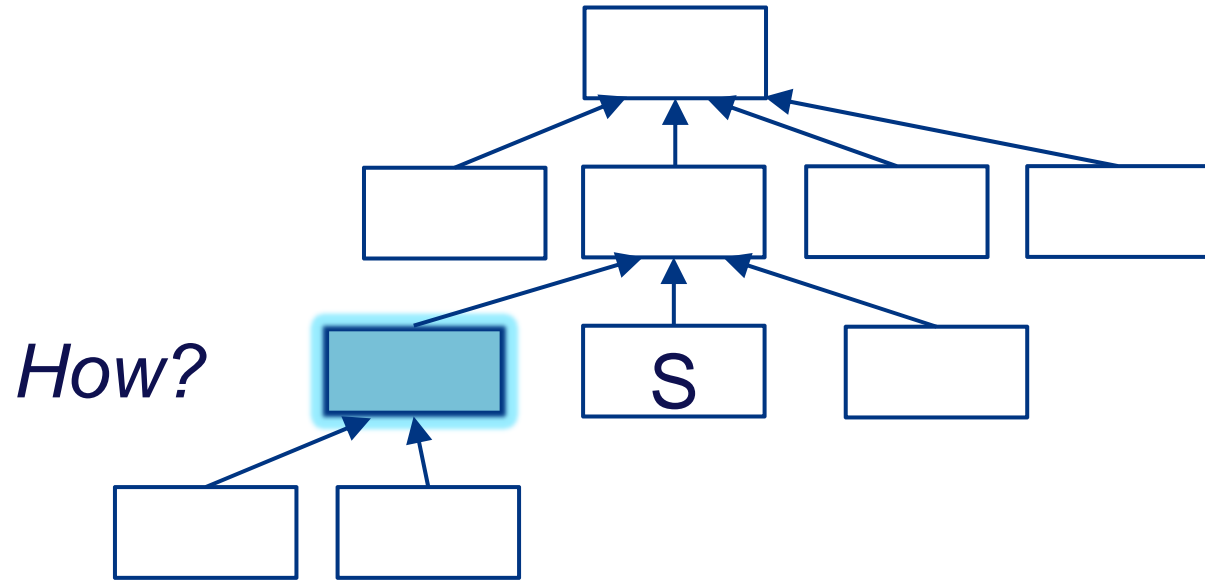
*Why? (and so on)*

*How?*



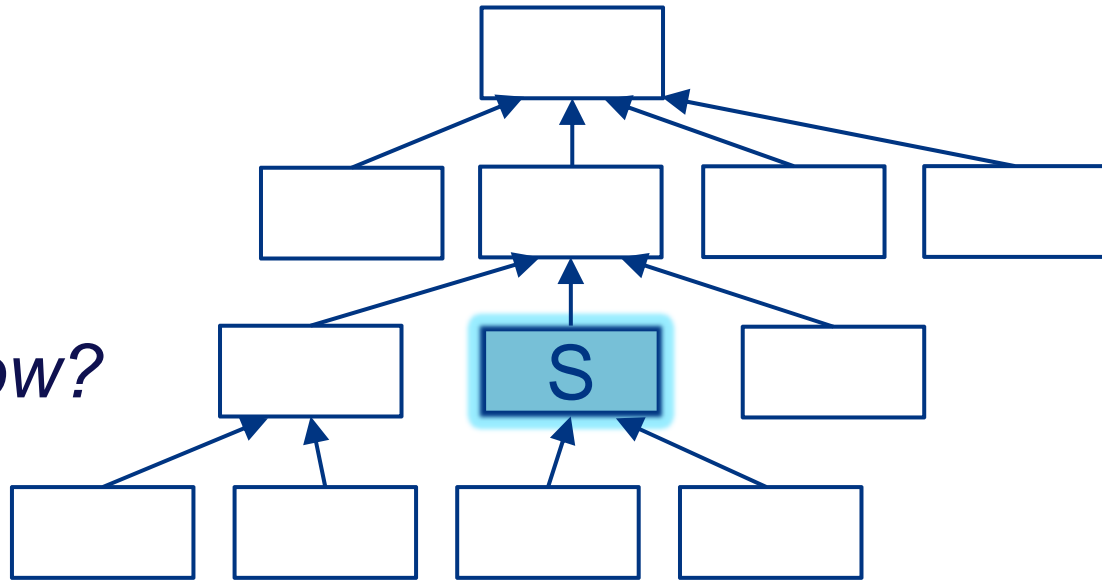
*How?*



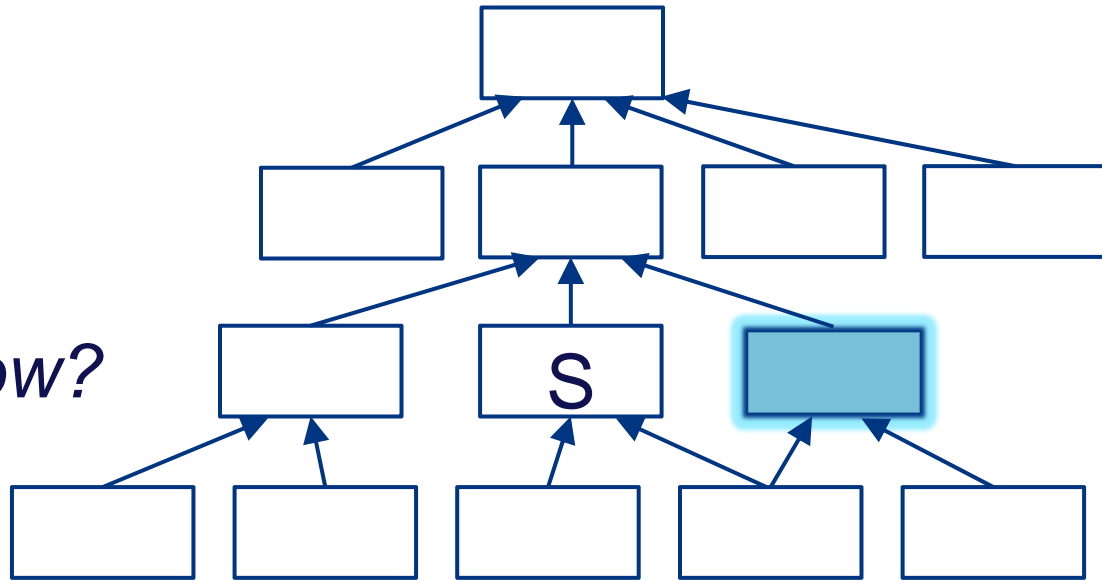


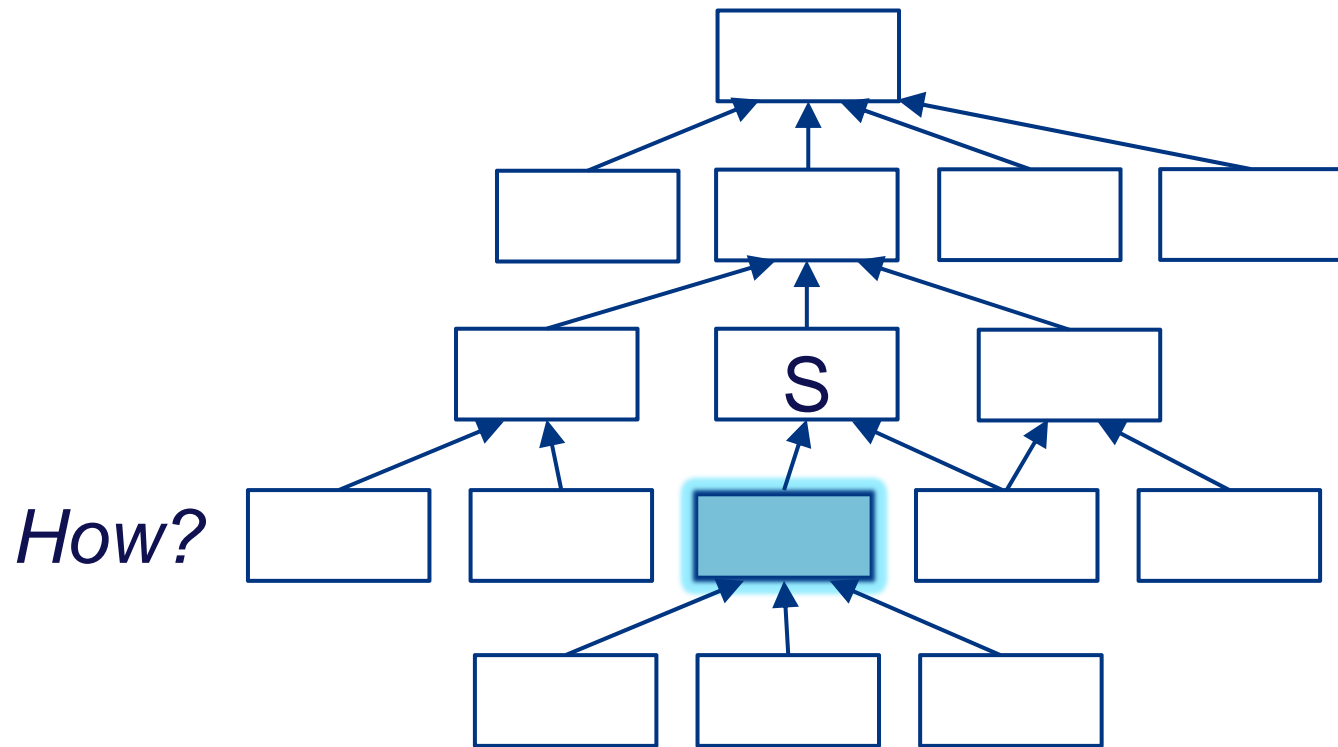


*How?*



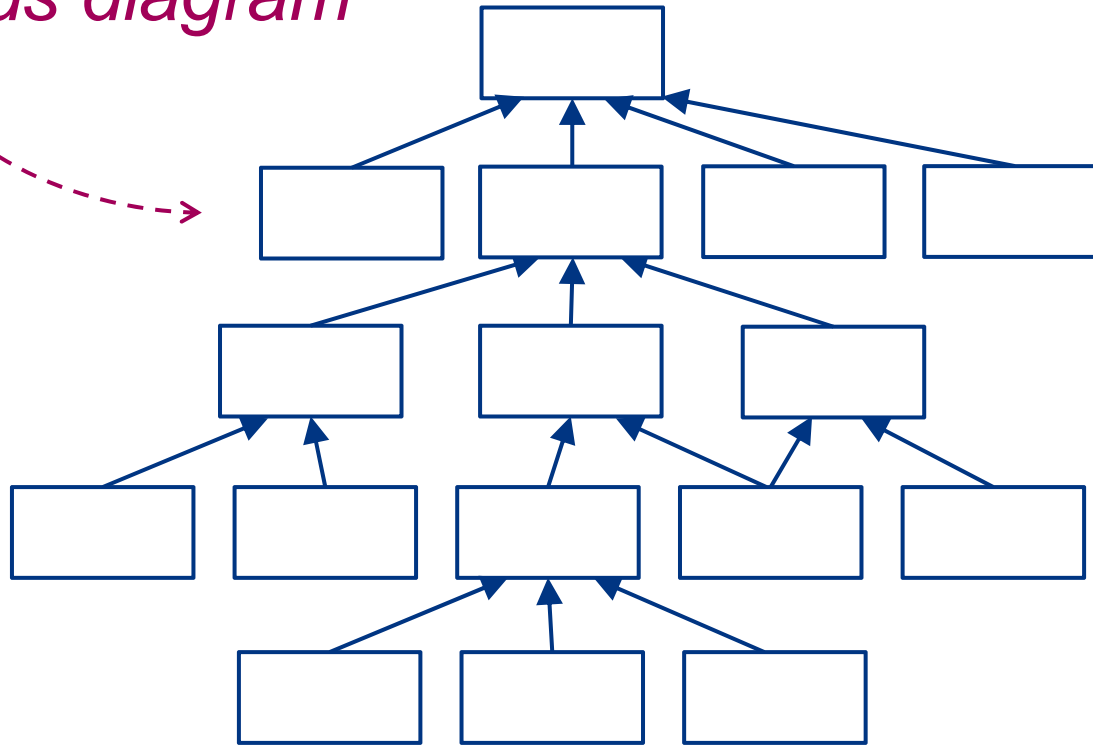
*How?*





*(and so on...)*

*“means-ends diagram”*

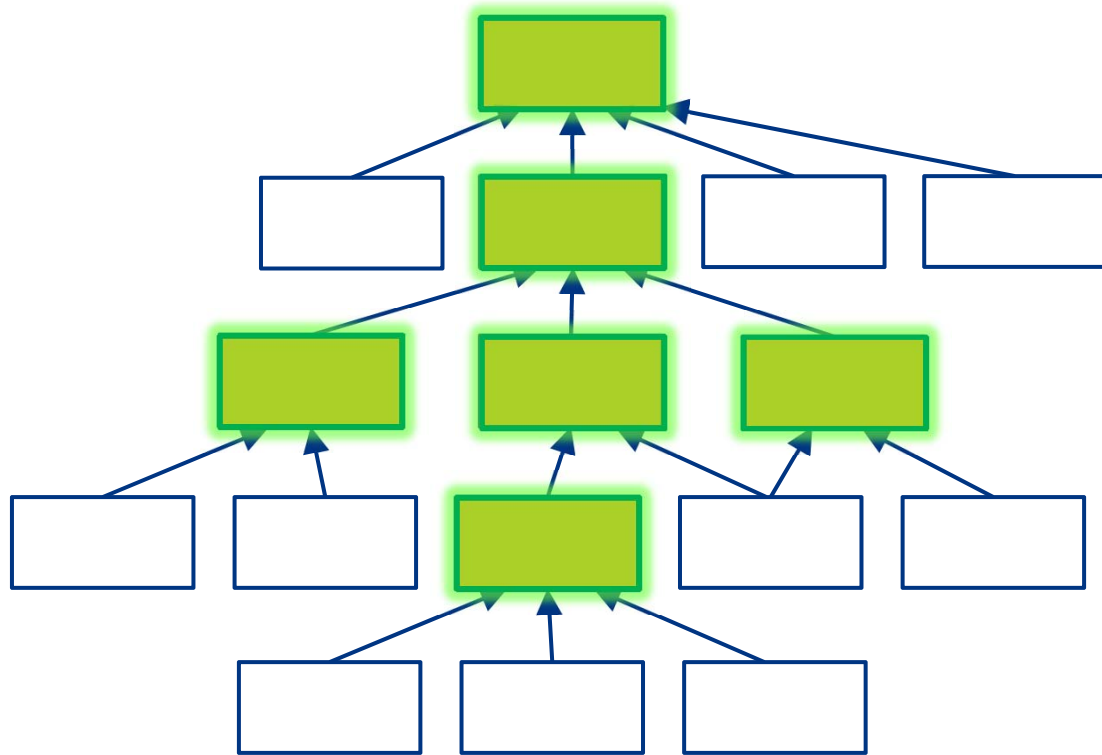


*problem 0*

*problem 1*

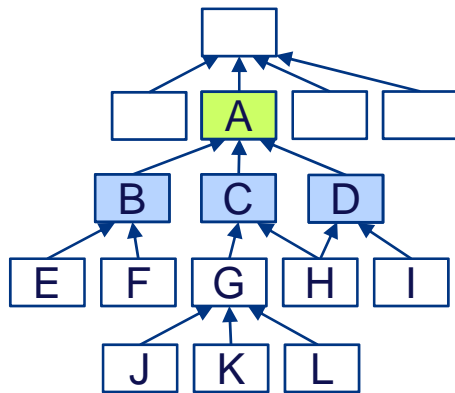
*problem 2, 3, 4*

*problem 5*



### 3. Problem statements for *several* “focal means/ends”

*means-ends diagram:*



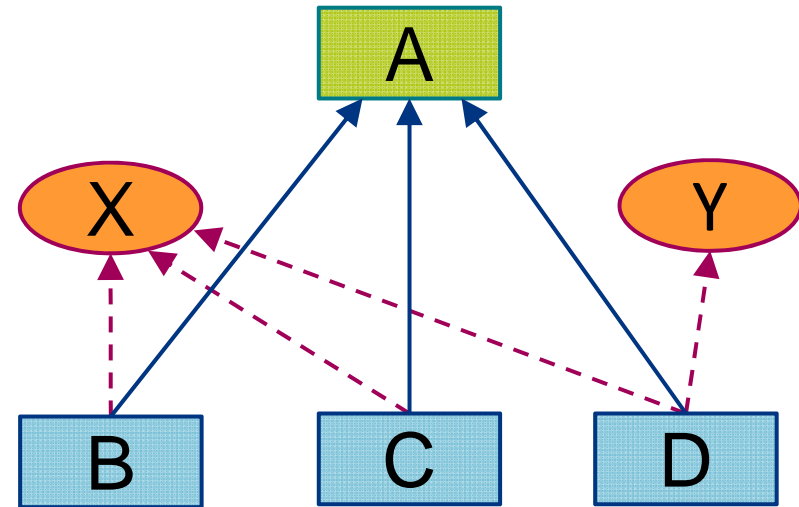
*“focal objective”*



*undesirable  
side effects  
of means*

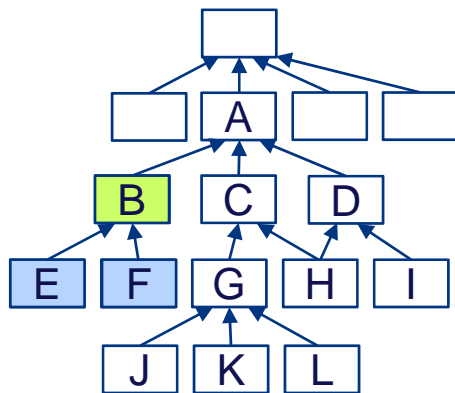


*problem statement:*



(1) “How can the client achieve **A** without (too much) **X** or **Y** ?”

means-ends diagram:



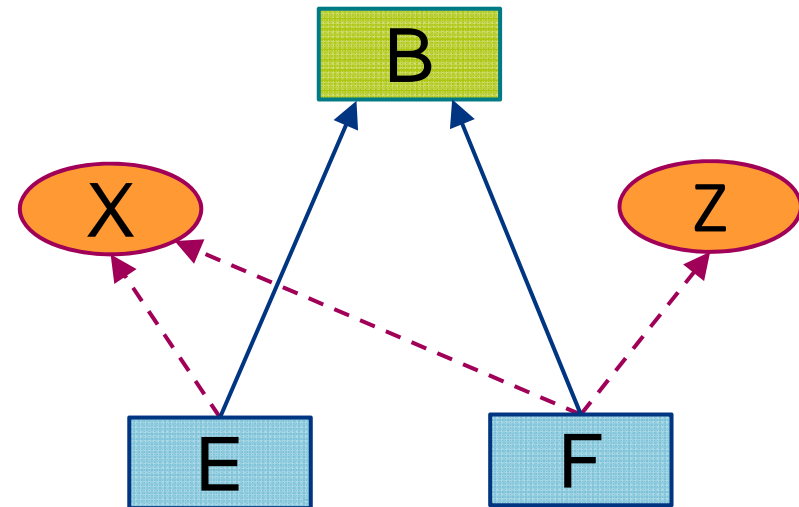
“focal objective”



undesirable  
side effects  
of means

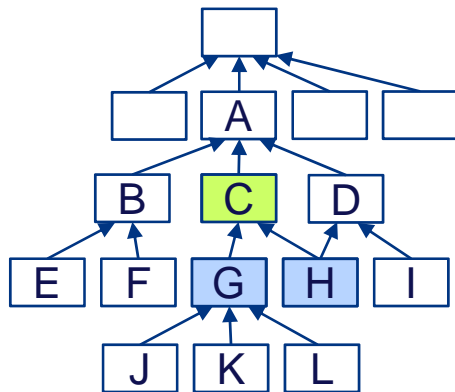


problem statement:



(2) “How can the client achieve **B** without (too much) **X** or **Z** ?”

*means-ends diagram:*



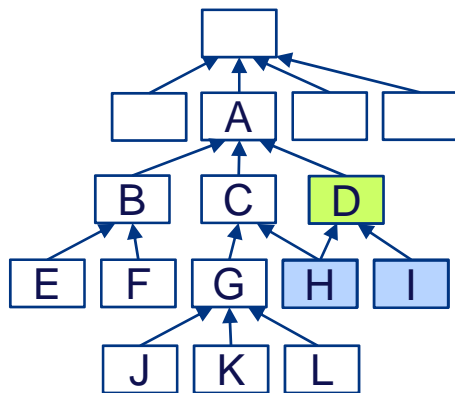
*undesirable side effects  
of means **G** and **H***



(3) “How can the client achieve **C** without (too much) ... ?”



means-ends diagram:

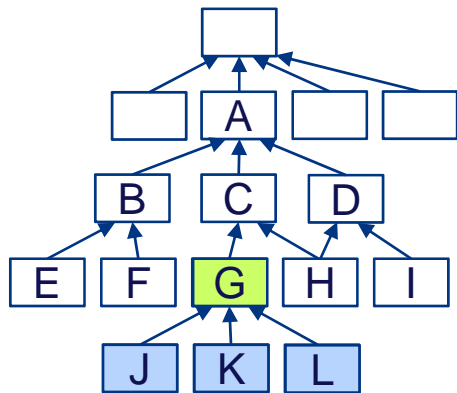


*undesirable side effects  
of means **H** and **I***



(4) “How can the client achieve **D** without (too much) ... ?”

means-ends diagram:



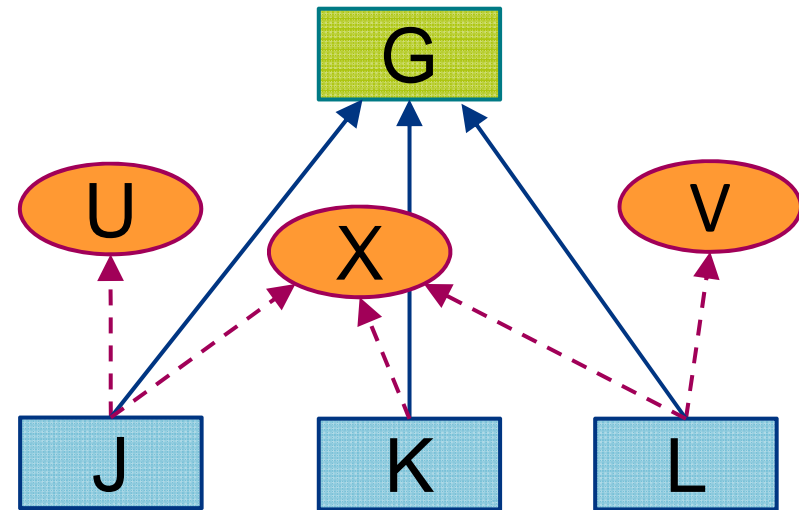
“focal objective”



undesirable  
side effects  
of means



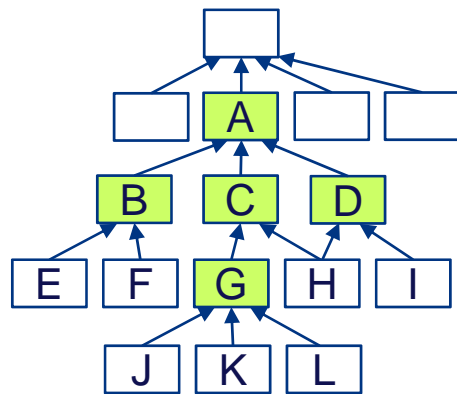
problem statement:



(5) “How can the client achieve **G** without (too much) **U**, **X** or **V** ?”

### 3. Problem statements for *several* “focal means/ends”

*means-ends diagram:*



(1) “How can the client achieve **A** without (too much) **X** or **Y** ?”

(2) “How can the client achieve **B** without (too much) **X** or **Z** ?”

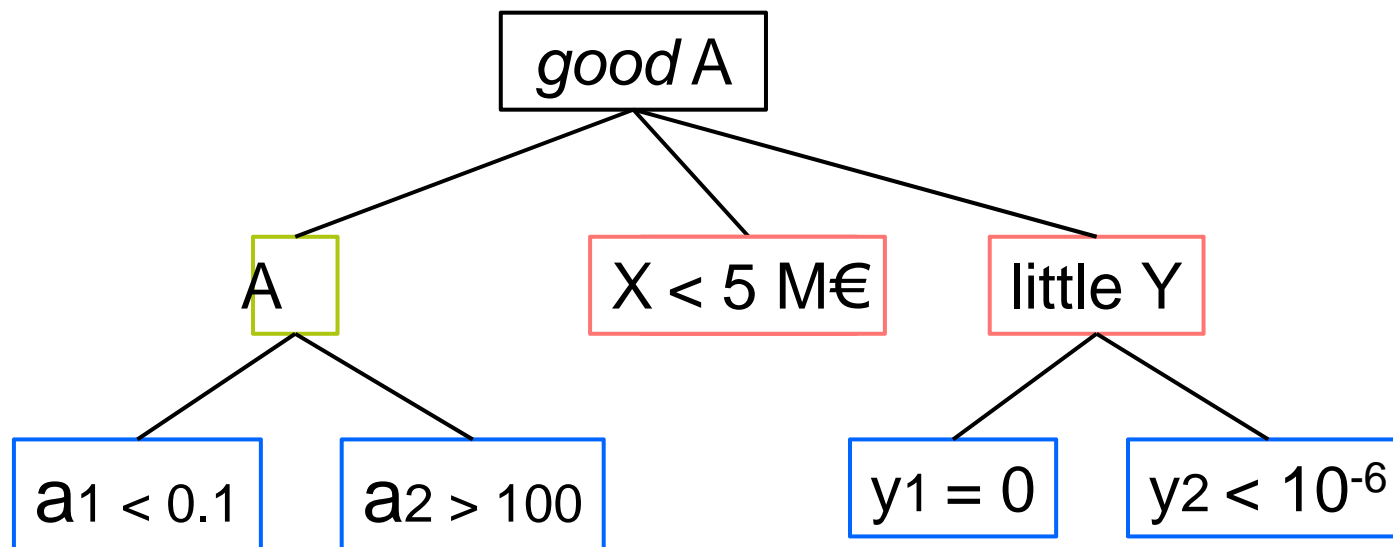
(3) “How can the client achieve **C** without (too much) ... ?”

(4) “How can the client achieve **D** without (too much) ... ?”

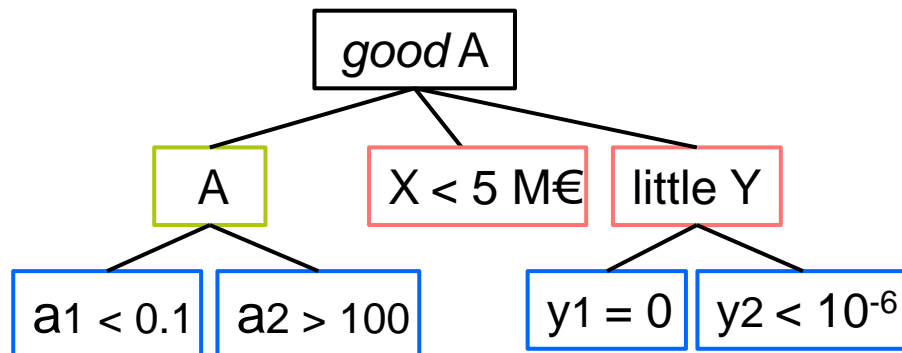
(5) “How can the client achieve **G** without (too much) **U**, **X** or **V** ?”

## 4. Problem statement $\rightarrow$ objectives tree

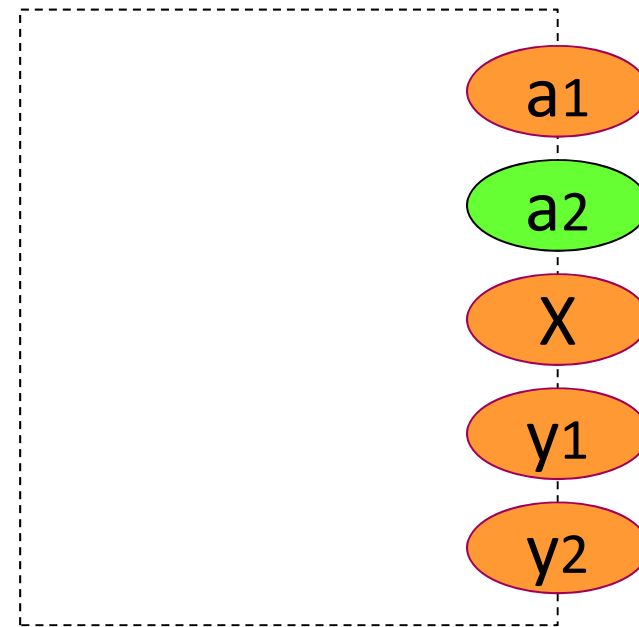
(1) “How can the client achieve A without (too much) X or Y ?”



## 4. Objectives tree → system diagram

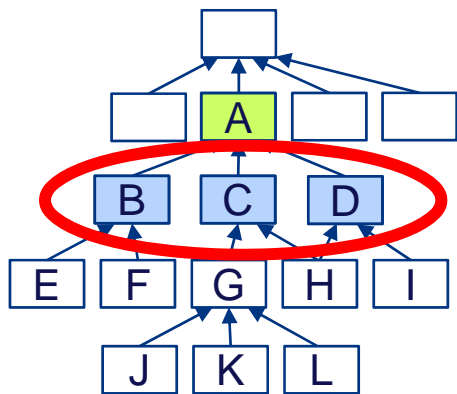


*objectives tree*

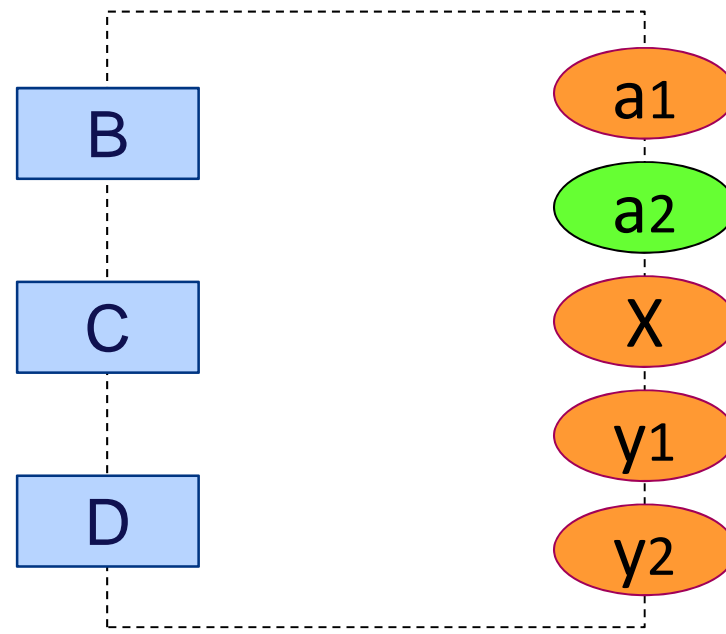


*criteria*

## 4. Add means to system diagram



*means-ends diagram*

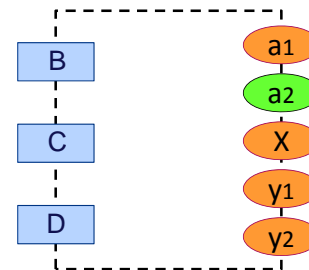


*means*

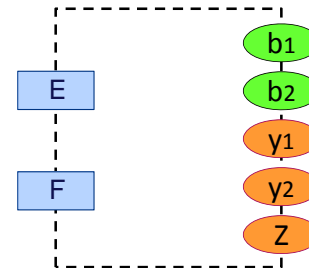
*criteria*

# 5. Choose one problem + associated system

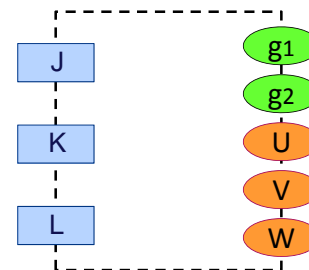
(1) “How can the client achieve **A** without (too much) **X** or **Y** ?”



(2) “How can the client achieve **B** without (too much) **Y** or **Z** ?”



(5) “How can the client achieve **G** without (too much) **U**, **V** or **W** ?”



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***Involve your client in this process!***