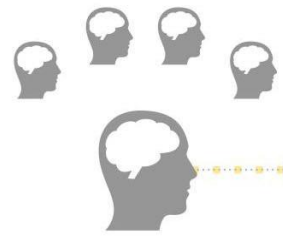
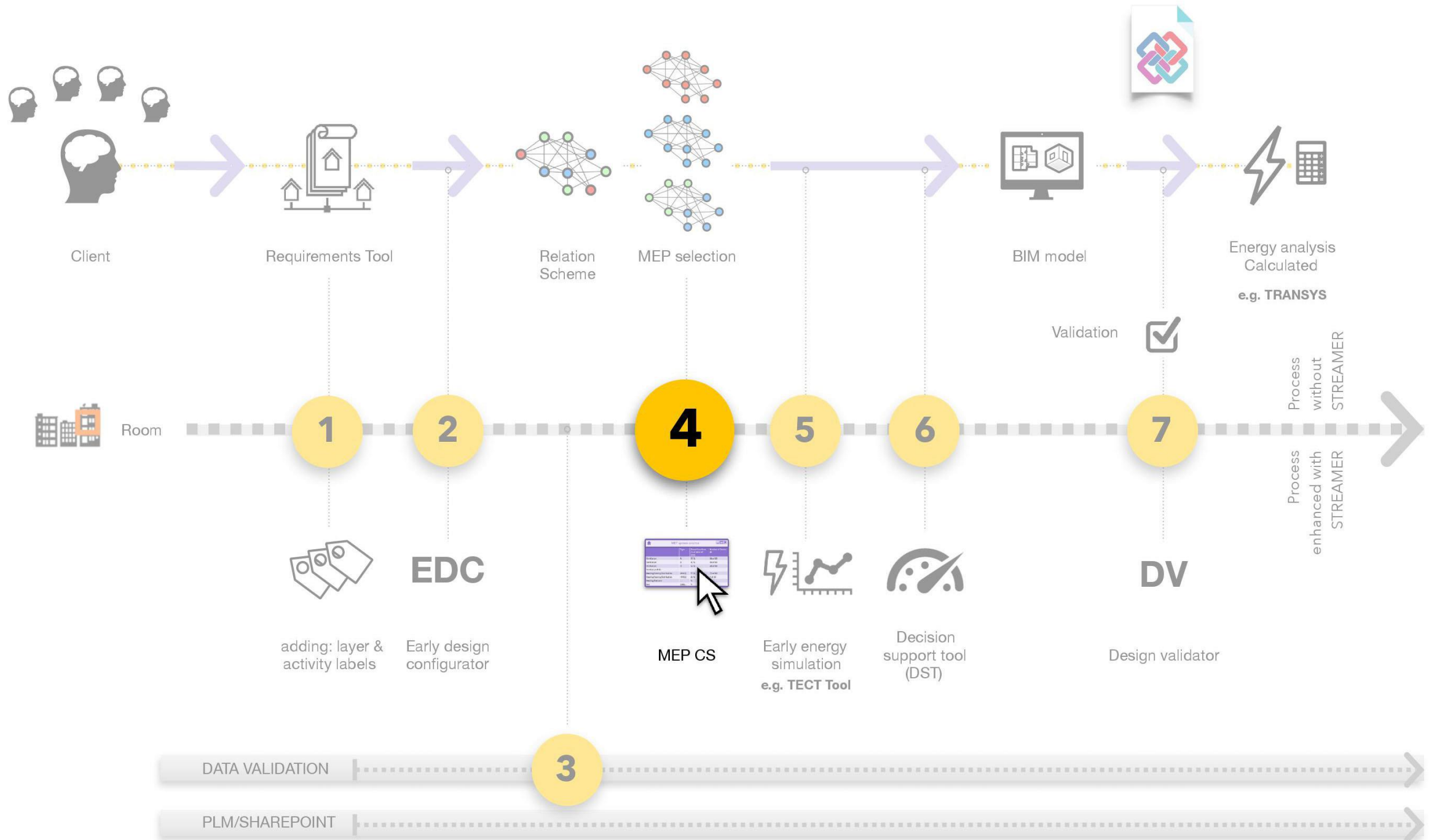


**STREAMER**

# Ontwerpmethodiek MEP selectie

DWA  
Jan-Peter Pols

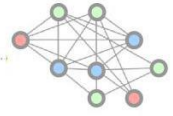




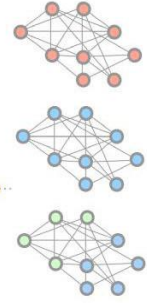
Client



Requirements Tool



Relation Scheme



MEP selection



BIM model



Energy analysis Calculated  
e.g. TRANSYS



Room



adding: layer & activity labels



**EDC**  
Early design configurator



MEP CS



Early energy simulation  
e.g. TECT Tool



Decision support tool (DST)



**DV**  
Design validator



Validation



DATA VALIDATION



PLM/SHAREPOINT

Process without STREAMER  
Process enhanced with STREAMER

## Modify IFC file with floorplan

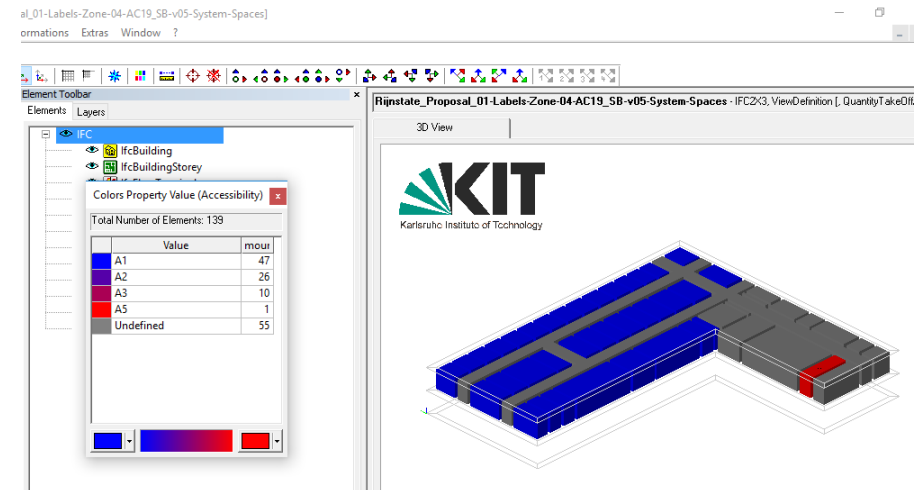
### Design MEP systems:

heating, cooling, ventilation, domestic hot water, lighting and equipment

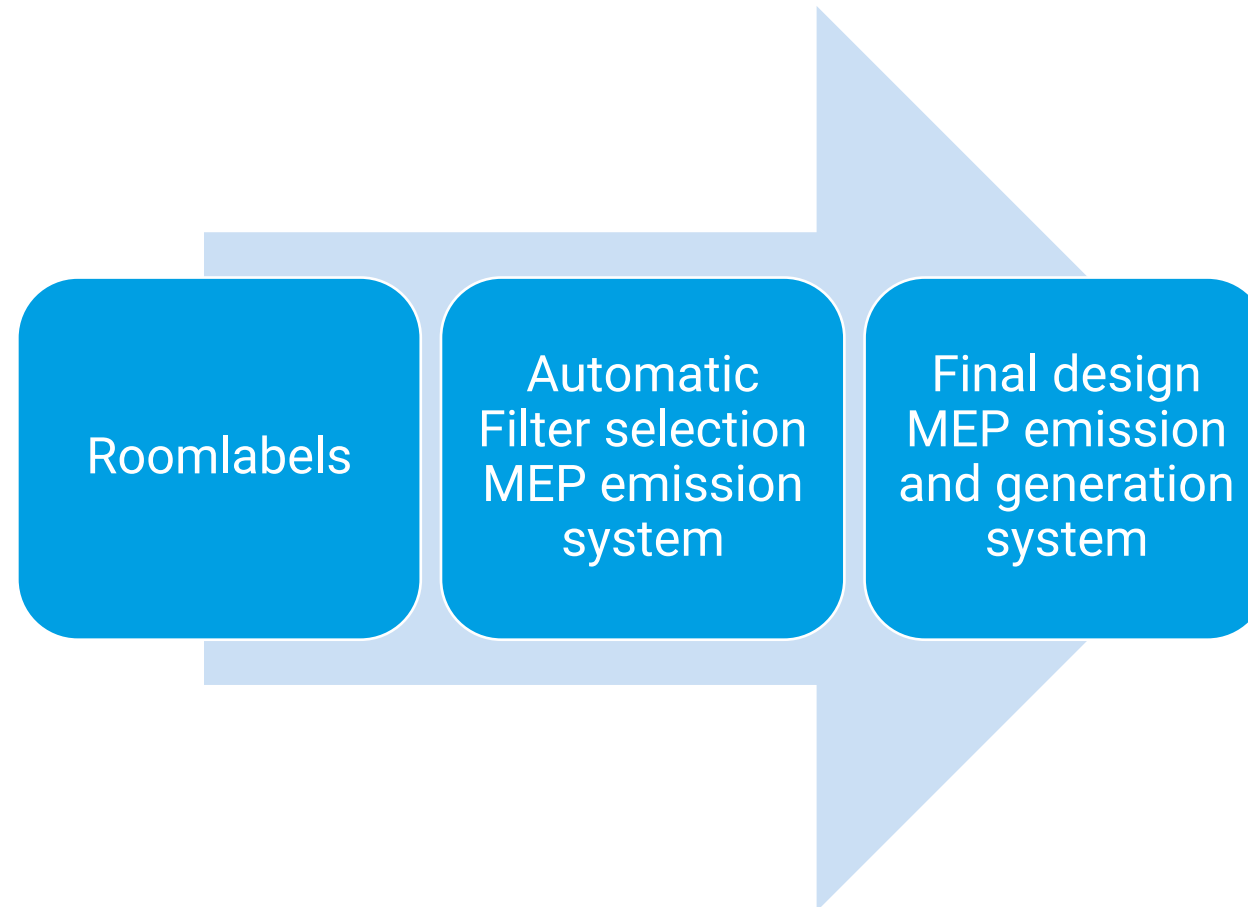
Both emission and generation

### Design EeB:

glazing, façade, roof

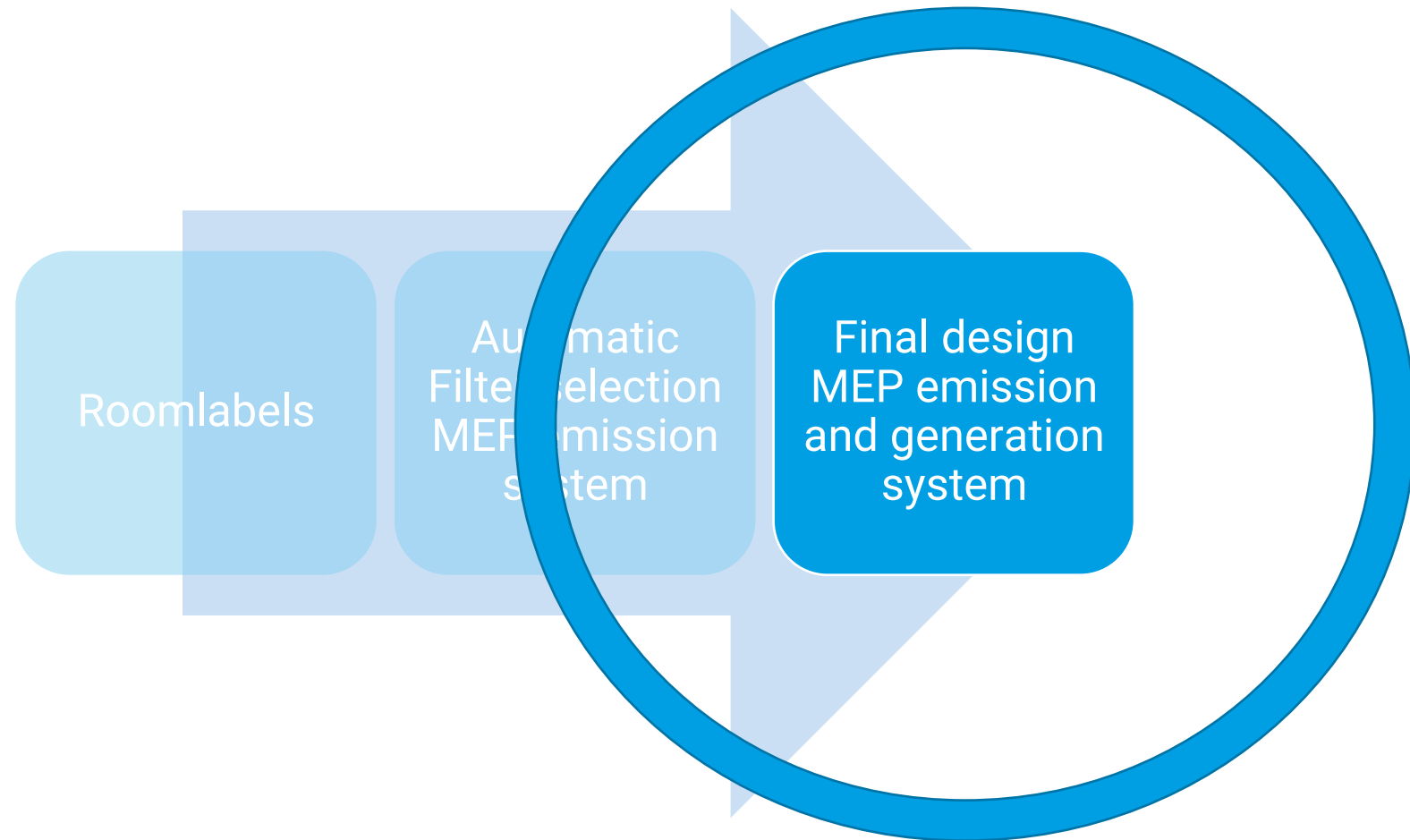


## 2 steps design proces





## Final design



## MEP design question 1

**1 or multiple emission system?**

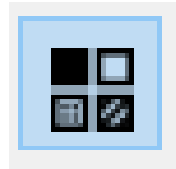
1. Start eveBIM;
2. select IFC file with design from EDC
3. Save as ...-MEP



Zoning

4. Create Zoning

MEP\_zoning

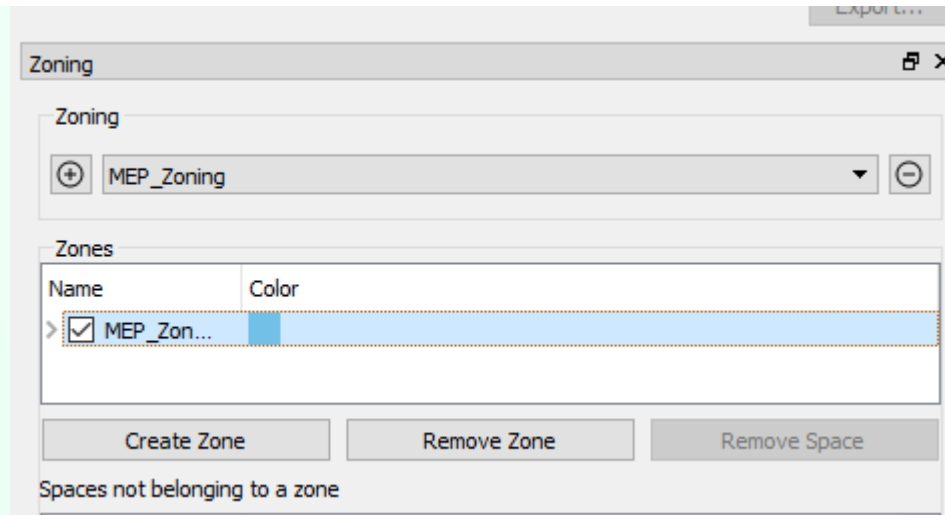


5. create (multiple?) zones

MEP\_zone\_1;

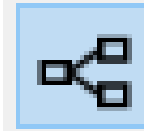
MEP\_zone\_2;

MEP\_zone\_3.





## Spatial



### 6. Add ifcSpaces per storey to zones

Name	Type
✓ <input checked="" type="checkbox"/> Proposal	IfcProject
<input checked="" type="checkbox"/> Site	IfcSite
<input checked="" type="checkbox"/> Building	IfcBuilding
> <input checked="" type="checkbox"/> Story 2	IfcBuildingStorey
> <input checked="" type="checkbox"/> Story 1	IfcBuildingStorey
> <input checked="" type="checkbox"/> Story 0	IfcBuildingStorey

Name	Type
<input type="checkbox"/> generated...	IfcWallStandar
> <input type="checkbox"/> generated...	IfcWallStandar
> <input type="checkbox"/> generated...	IfcWallStandar
<input type="checkbox"/> generated...	IfcWallStandar
> <input type="checkbox"/> generated...	IfcWallStandar
<input type="checkbox"/> generated...	IfcWallStandar
<input type="checkbox"/> generated_sla...	IfcSlab
<input checked="" type="checkbox"/> waste roo...	IfcSpace
<input checked="" type="checkbox"/> space_43	IfcSpace
<input checked="" type="checkbox"/> space_38	IfcSpace
<input checked="" type="checkbox"/> space_39	IfcSpace
<input checked="" type="checkbox"/> consultati...	IfcSpace
<input checked="" type="checkbox"/> store roo...	IfcSpace
<input checked="" type="checkbox"/> space_33	IfcSpace
<input checked="" type="checkbox"/> space_34	IfcSpace
<input checked="" type="checkbox"/> space_35	IfcSpace
<input checked="" type="checkbox"/> space_36	IfcSpace

Select ifcSpaces  
Drag and drop

✓ <input checked="" type="checkbox"/> MEP_Zone_1
<input checked="" type="checkbox"/> space_53
<input checked="" type="checkbox"/> office headmanager
<input checked="" type="checkbox"/> office DIVA nurse
<input checked="" type="checkbox"/> dressing room
<input checked="" type="checkbox"/> office (flexroom)
<input checked="" type="checkbox"/> office training section
<input checked="" type="checkbox"/> office HIV nurse
<input checked="" type="checkbox"/> store room #2
<input checked="" type="checkbox"/> office trainee doctor
<input checked="" type="checkbox"/> Photocopier/IT room
<input checked="" type="checkbox"/> consultation + examination ro...
<input checked="" type="checkbox"/> conference room
<input checked="" type="checkbox"/> office oncology nurse
<input checked="" type="checkbox"/> space_0

### 7. Save file

## MEP systems reference table (extract #1)

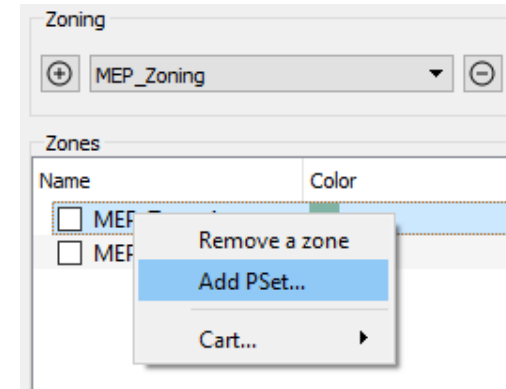
Pset name	Property name	System code	Description	Efficiency	Recirculation	Efficiency heat recovery	C <sub>sys.vent.med</sub>
		(for IFC file)	[-]	[-]	[-]	[-]	[W.h/m <sup>3</sup> ]
Streamer_Labels_MEP	Emission heating	Emis_H_01	Local heating, including (electric) radiant heating,	1,00			
		Emis_H_02	Radiator heating and / or convector for outer wall;	1,00			
		Emis_H_03	Radiator heating and / or convector heating door	0,95			
		Emis_H_04	Radiator heating and / or convector heating for	1,00			
		Emis_H_05	Floor heating and / or wall heating and / or	1,00			
		Emis_H_06	Air heating (including air conditioning and split	0,95			
	Ventilation system	Vent_01	Natural ventilation		0	0	0
		Vent_02	Mechanical supply and natural exhaust		0	0	0,33
		Vent_03	Mechanical exhaust and natural supply		0	0	0,33
		Vent_04	Mechanical supply and exhaust with heat recovery		0,15	0,45	0,83
	Emission cooling	Emis_C_01	Fan coil (centralized system, high parameters)		0,98		
		Emis_C_02	Fan coil (decentralized system)		1,00		
		Emis_C_03	Chilled beam		0,98		
		Emis_C_04	Cooling ceiling		0,98		
		Emis_C_05	Laminar flow ceilings		1,00		
		Emis_C_06	VRF inside air - conditioning unit		0,95		
	Domestic Hot Water system	Emis_DHW_01	Water taps located max 3m distance of the		1,00		
		Emis_DHW_02	Water taps with local electric hot water boiler		1,00		
		Emis_DHW_03	Water taps located more that 3m distance of the		0,80		

## MEP systems reference table (extract #2)

Pset name	Property name	Investment cost	Investment cost	Investment cost	Maintenance cost	Maintenance cost	Maintenance cost
		€/m <sup>3</sup> .h	€/m <sup>2</sup>	€/kw	€/m <sup>3</sup> .h	€/m <sup>2</sup>	€/kW
Streamer_Labels_MEP	Emission heating			427,36			4,27
				335,25			3,35
				335,25			3,35
				335,25			3,35
			20,35			0,41	
				110,47			6,63
	Ventilation system		0,00			0,00	
			0,19			0,01	
			0,16			0,03	
			0,48			0,12	
	Emission cooling				263,00		15,78
					263,00		15,78
			48,00				0,96
			30,00				0,60
						to be set individually	
					263,00		15,78
	Domestic Hot Water system			36,00			0,72
				55,00			1,10
				36,00			0,72
				1,20			0,02

Select MEP\_zone\_1

8. Add Pset



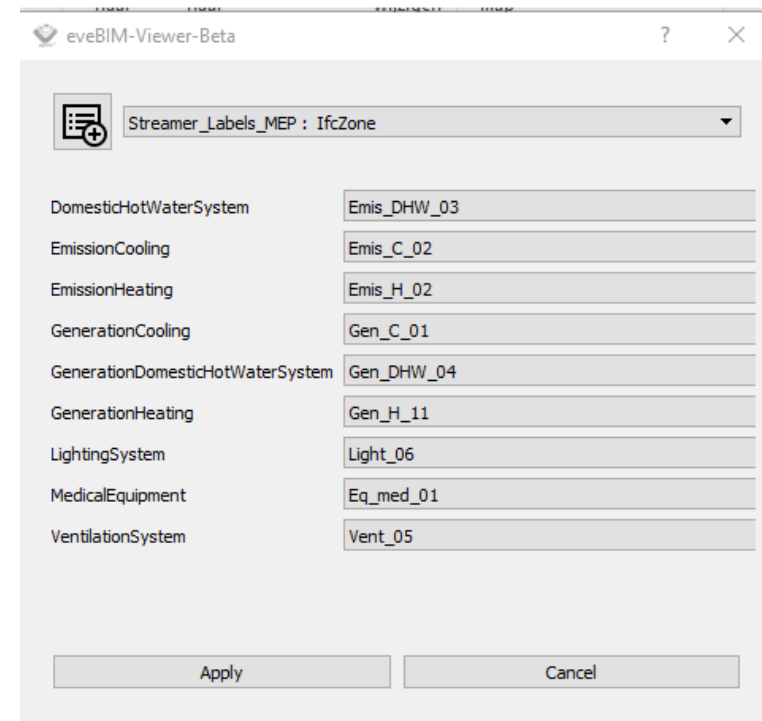
9. Select MEP properties



**STREAMER\_Labels\_MEP : IfcZone**

MEP\_zone\_2

MEP\_zone\_3



10. Save file

## MEP design question 2

**Design alternative?  
energy efficient**

11. save as ...-MEP-2

Select MEP\_zone\_1

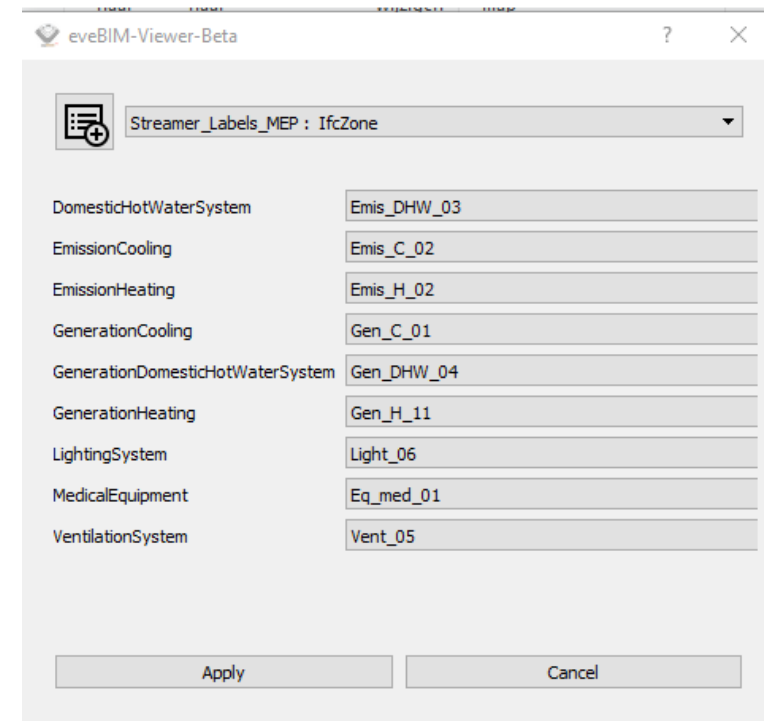
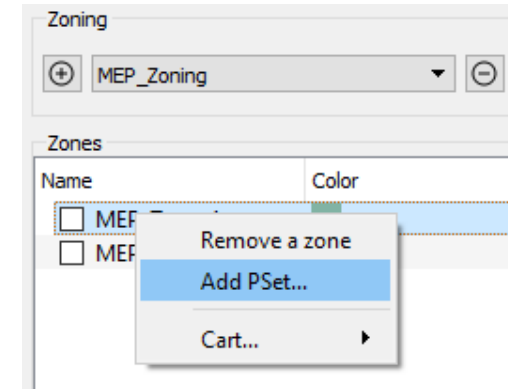
12. Add Pset

13. Select MEP properties  
**STREAMER\_Labels\_MEP : IfcZone**

MEP\_zone\_2

MEP\_zone\_3

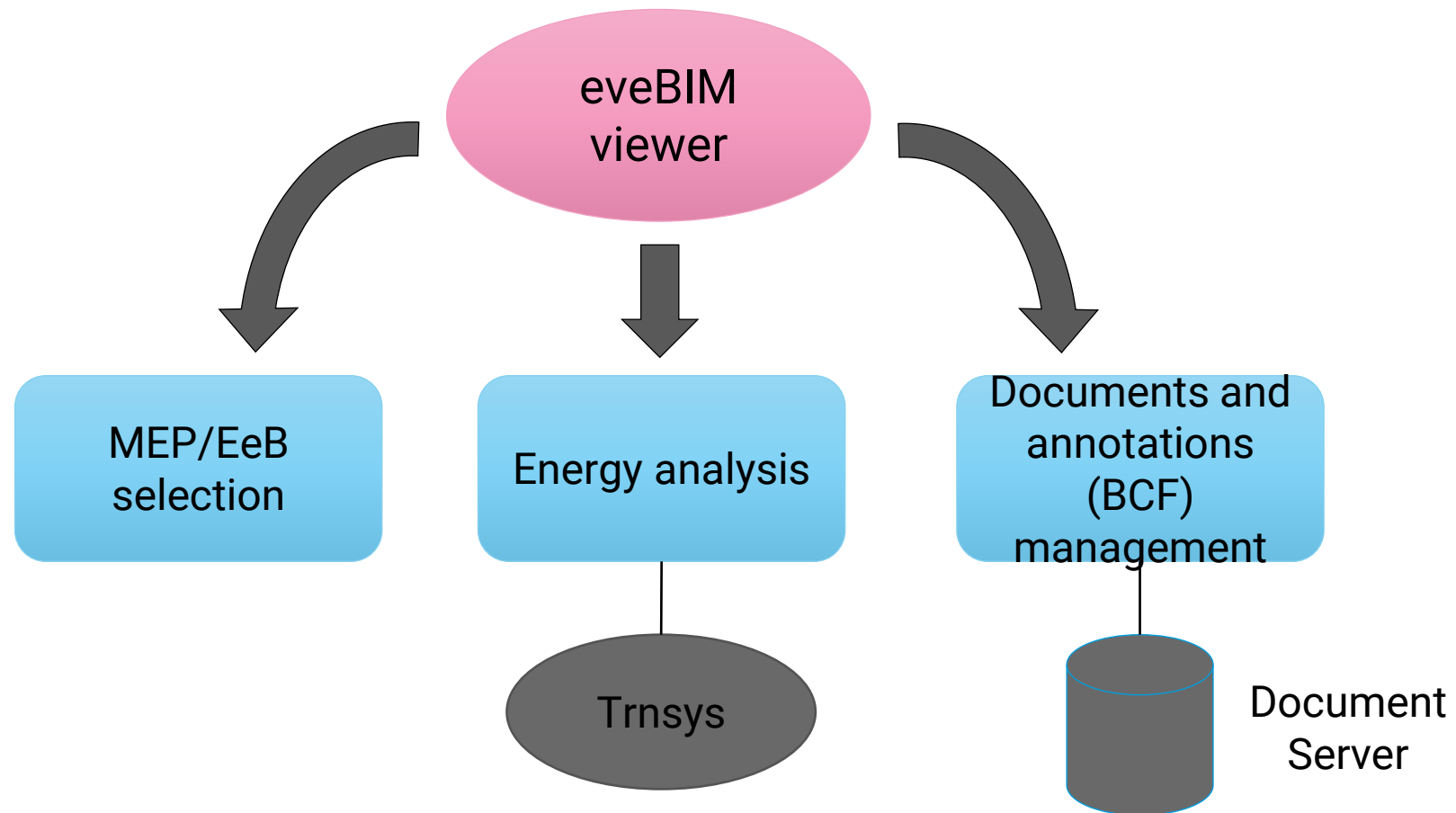
14. Save file



**Bedankt voor uw aandacht**

Jan-Peter Pols  
DWA - Strategy  
pols@dwa.nl  
06-52390144

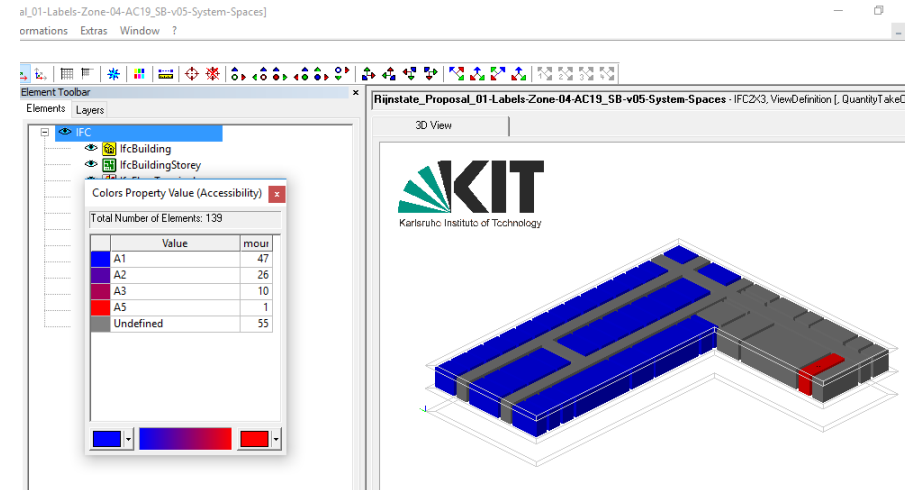
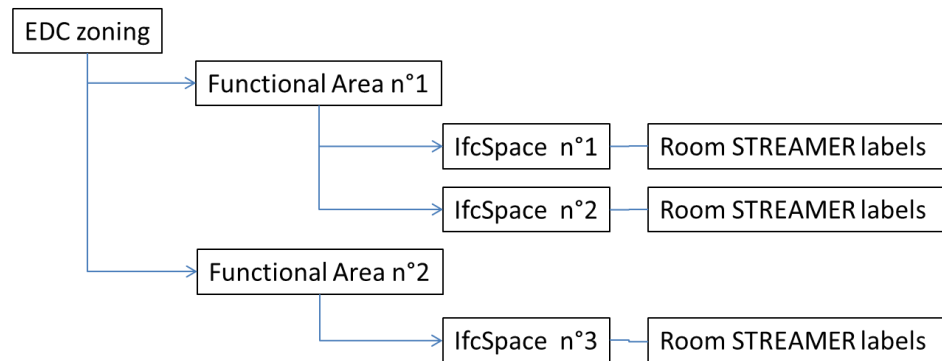
## eveBIM in STREAMER design workflow





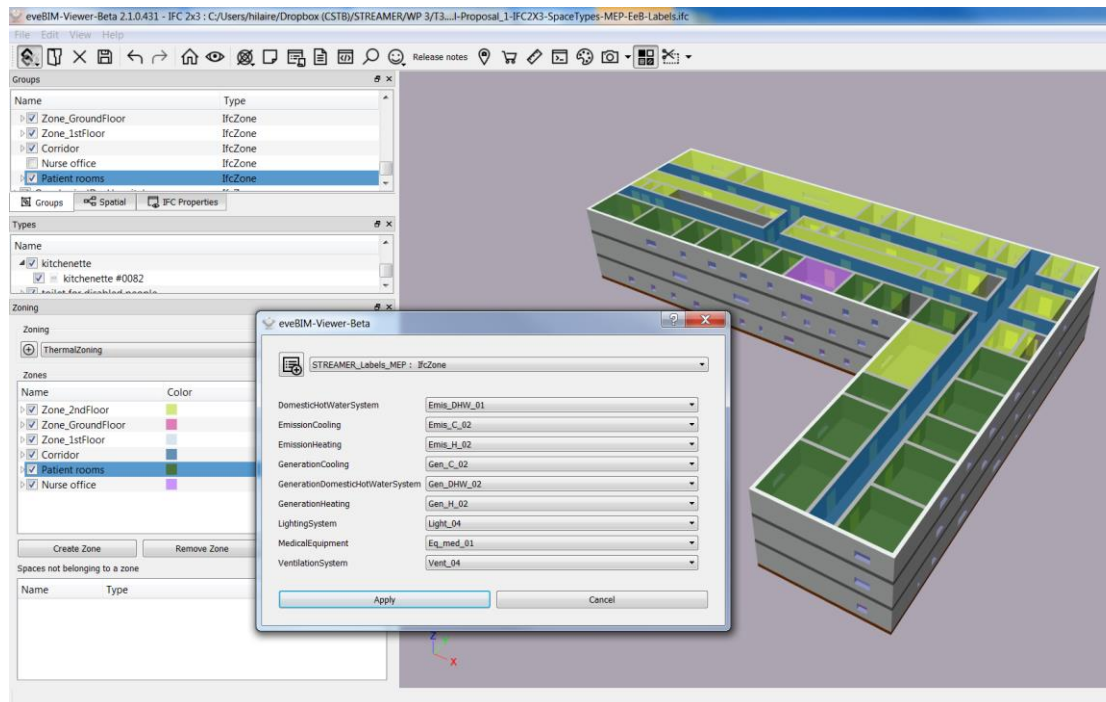
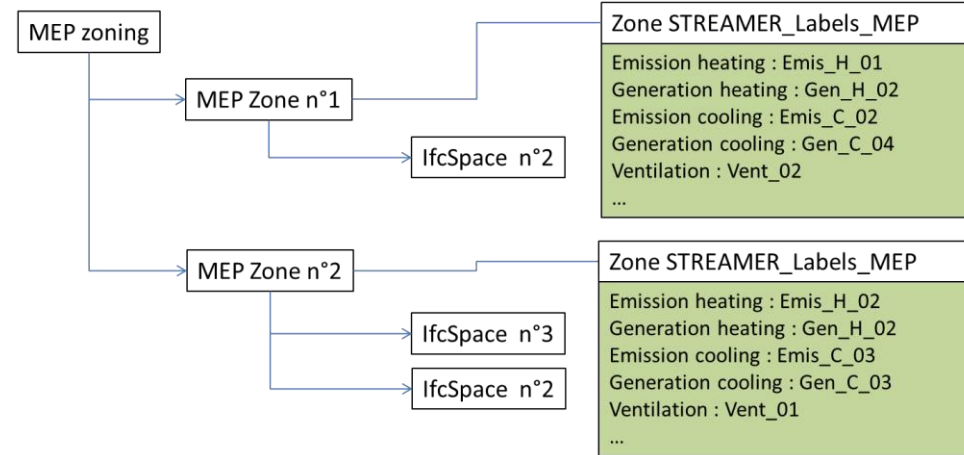
## MEP/EeB selection methodology

- Based on the labels assigned in the PoR, MEP systems are defined at room level in the EDC



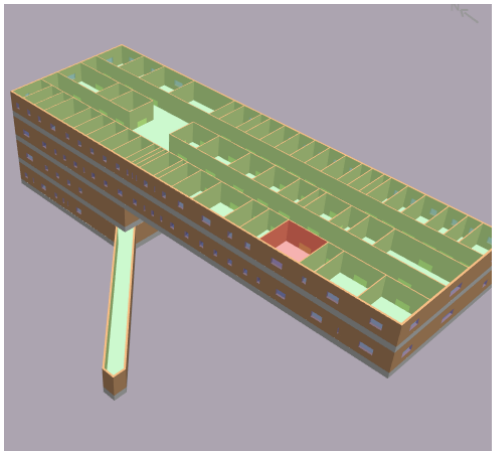
- But this first level of labels does not provide information about how to mutualise equipment.
- It is the objective of the MEP selector which allows engineers to group rooms together and attach to each group a same type of equipment.
- Similar need raises for grouping envelope components and attach to each group a same type of EeB technological solution.

## MEP/EeB Selector



The user is able to manually :

- Select **IfcSpace** and group them in **IfcZone** with a common MEP system
- Select **IfcElement** (Wall, window, roof and ground) and group them in **IfcGroup** with a common EeB envelope solution
- Enrich previously created MEP zone or EeB group with specific STREAMER Pset:
  - STREAMER\_Labels\_MEP
  - STREAMER\_Labels\_EeB



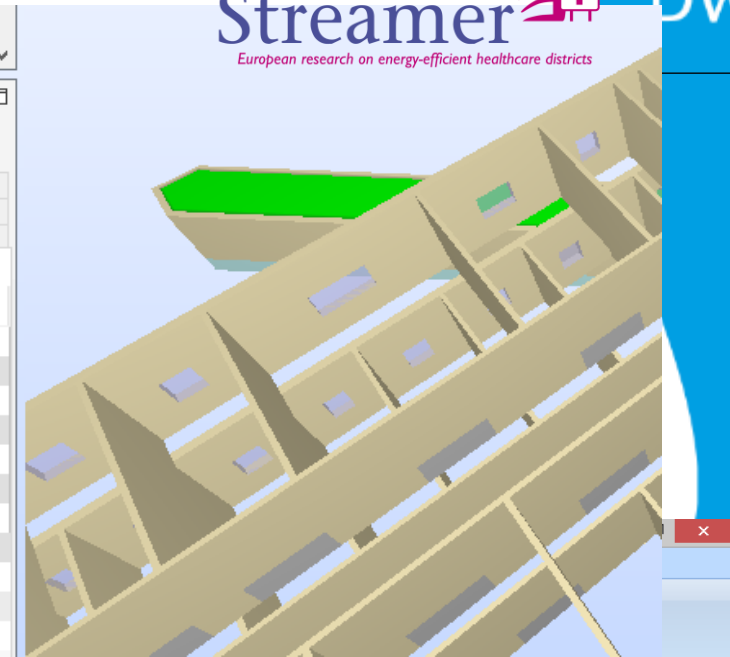
Functional Description	Detailed IFC Description
Name	Value
> Pset_SpaceCommon	1
▼ STREAMER_Labels_PoR	7
AccessSecurity	A2
BouwcollegeLayer	0
ComfortClass	CT3
Construction	C1
Equipment	EQ1
HygienicClass	H1
UserProfile	U1
▼ STREAMER_PoR	4
Amount	1
FunctionalAreaType	DiagnosticImaging
Required_Area	37.1 [SQUARE_METRE]
RoomType	WaitingRoom
> STREAMER_Room	3
▼ Streamer Energy	7
Cold Demand	153.551
Energy Consumption cooling system	180.648
Energy Consumption heating system	287.607
Floor Area	37.1
Heat Demand	258.847
Max Power Cold Demand	0.946307
Max Power Heat Demand	3.13277

Space.U.11 : telephone room[telephone room]  
 Space.O.12 : basement[basement]  
 Space.O.13 : consultation, Examination room

**Info**

Space.O.2 : space\_4[space\_4]

BaseQuantities	Corridor_property	eveBIM PSet
Space Boundary Areas	Classification	Hyperlinks
Identification	Location	Quantities
Relations	Space Boundaries	
Pset_SpaceCommon	STREAMER_Labels_PoR	
Property	Value	
AccessSecurity	A1	
BouwcollegeLayer	H	
ComfortClass	CT2	
Construction	C1	
Equipment	EQ1	
HygienicClass	H1	
UserProfile	U4	



Project

New Project Proposal Site Building Building 2 New  
 Load project Save project PoR Import Design Rules Import filter set Building 2  
 Create testdata dialog Test  
 Open wizard Open output folder Resources App

Project

- Project 0
  - Requirement sets
    - 170713 - ruimtelijst Rijnstate NO
  - Rule sets
    - ClusterAllFunctionalAreaTypes3
  - Filter sets
    - HVACFilter
  - Buildings
  - Building 2

SystemLabel	RuleName												
Ventilation	Ventilation type A	VA	Natur...lation	H1	EQ1	U1 U2 U3 U4	CT1 CT2		C1 C2 C3 C4 C5 C6				
Ventilation	Ventilation type B	VB	Mecha...haust	H2 H3 H4 H5	EQ1	U1 U2 U3 U4	CT1 CT2		C1 C2 C3 C4 C5 C6				
Ventilation	Ventilation type C	VC	Mech...upply	H2	EQ1 E... EQ6	U1 U2 U3 U4	CT3 CT4 CT5 CT6 CT7 CT8		C1 C2 C3 C4 C5 C6				
Ventilation	Ventilation type D	VD	Mecha...haust	H3 H4 H5	EQ2 E... EQ6	U1 U2 U3 U4	CT3 CT4 CT5 CT6 CT7 CT8		C1 C2 C3 C4 C5 C6				