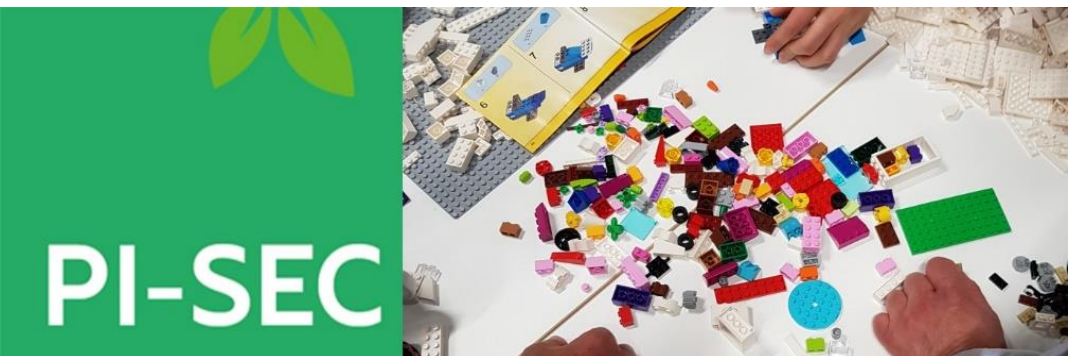
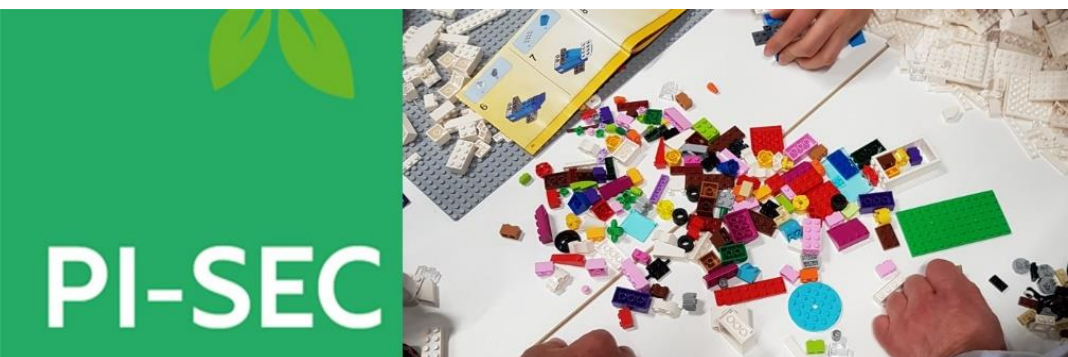




Spørsmål fra WP1

Kommunen setter seg mål på temaene miljø og energi

- Hvordan sette realistiske mål og følge disse opp på en enklere måte?



Mål og indikator

Mål (Eks: Redusere CO₂ utslipp)



Indikator (Eks: % reduksjon av CO₂ utslipp med utgangspunkt i år 2017)



Urban planning

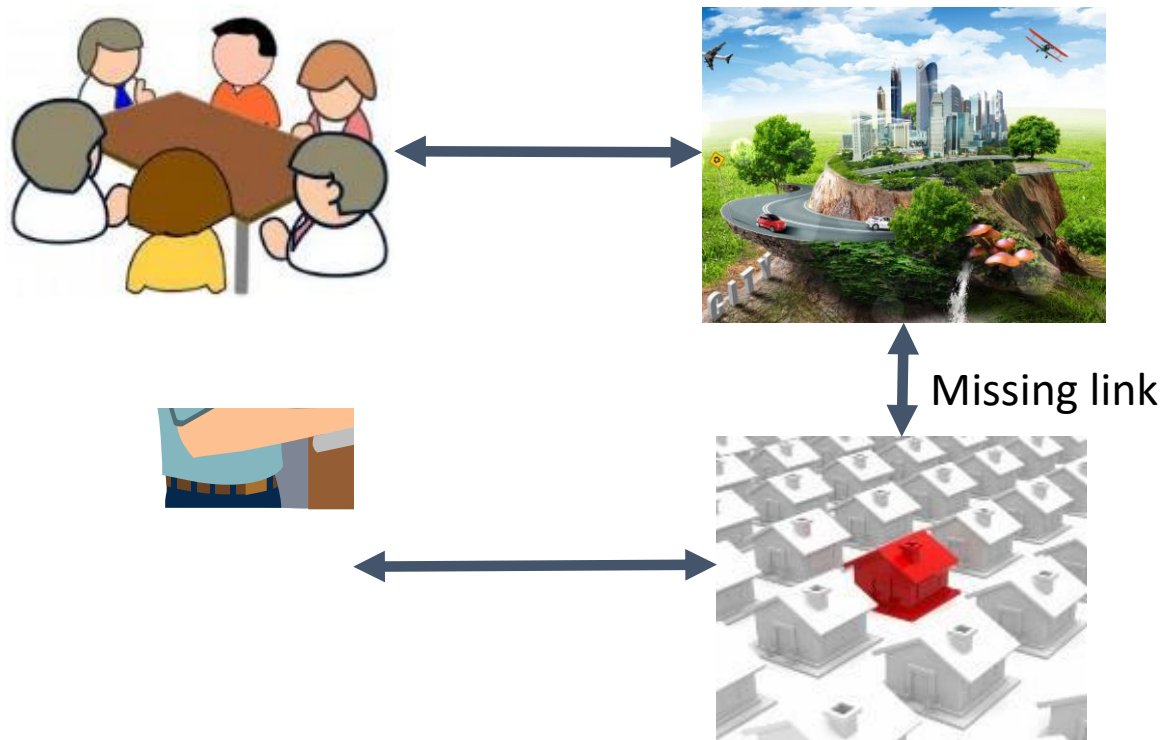
- Define goals
- Set realistic scenarios
- Find target incentives

Estate development

- Define goals
- Reveal deviation

Indicators

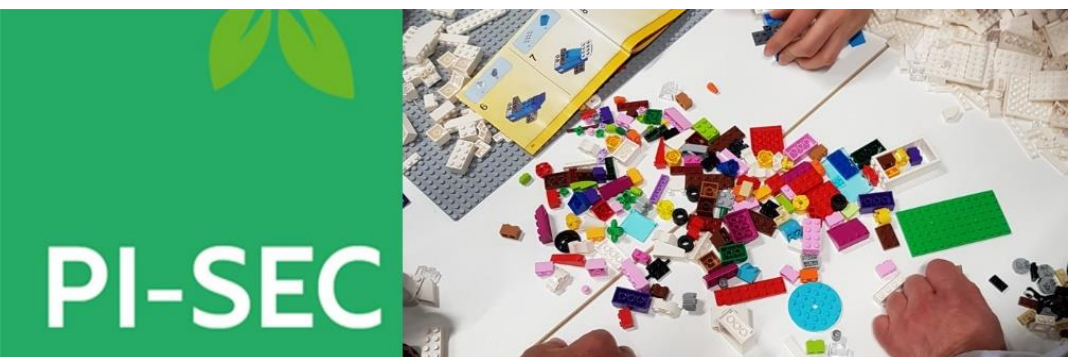
- Define baseline
- Measure progress
- Adjust plans





- Steg 1 – Definere prosjekt og sette mål
- Steg 2 – Legge inn eksisterende bygninger og energisystem
- Steg 3 – Baseline scenario
- Steg 4 – Utviklings scenarioer
- Steg 5 – Kalkulering & analyse
- Steg 6 – Indikatoroppfølging

Iterativ prosess

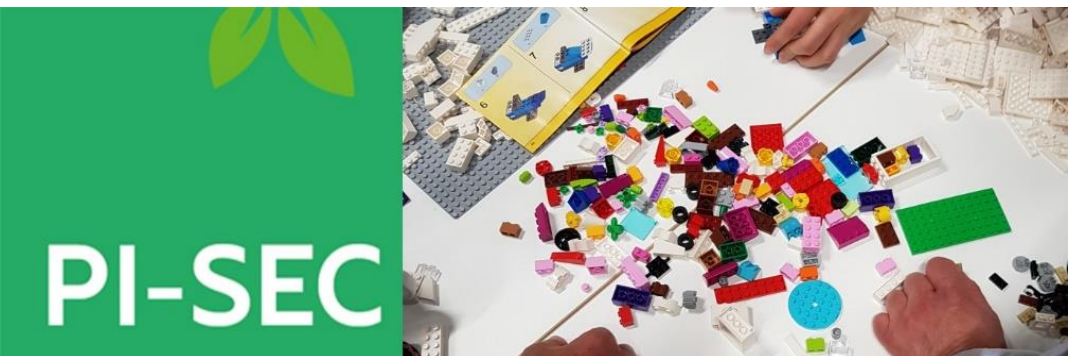


Steg 1 – Definere prosjekt

PI-SEC KPI planning TOOL
Front Page

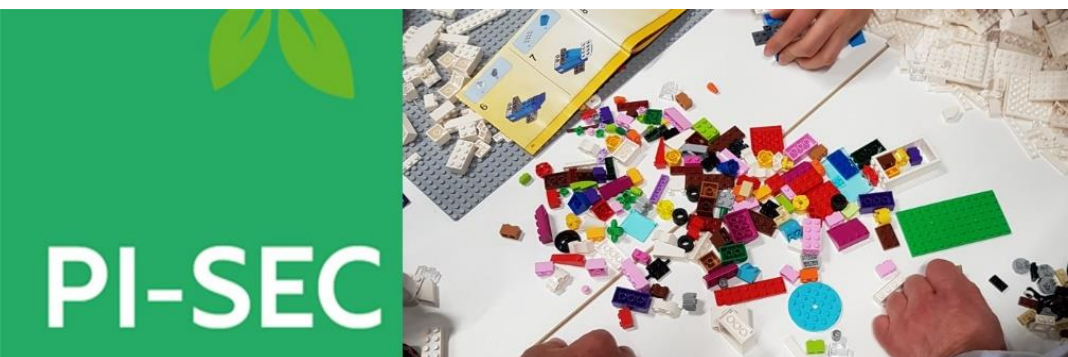
Neighbourhood:
Furuset

Key data, goals and indicators									
KEY DATA		Now	End of project						
Project timeframe		2015	2030						
Population									
Number of jobs									
Area									
Number of buildings									
Area of buildings									
GOALS	Add	Remove	KPI	Unit	Comparison	Relative to Goal at EoP			
Energy Consumption			Energy use total	/m2 BRA	% Reduction	Baseline	20		
Energy Consumption			Electricity consumption total	/inhabitant	Absolute		10000		
Carbon Emission			Energy/buildings	/inhabitant	% Reduction	Baseline	50		
Energy Generation			RES produced Electricity	/inhabitant	Absolute	Initial	200		
Menu									
Create Baseline		Calculate Project							
Create Scenario									



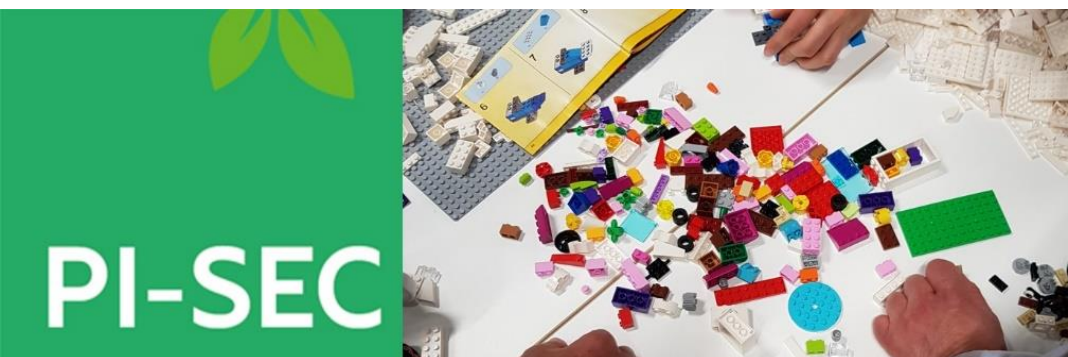
Steg 2 – Legge inn eksisterende bygninger og energisystem

PI-SEC KPI planning TOOL			Initial Situation		2015		
Neighbourhood			Furuset				
Buildings	Add	Upgrade	Demolish				
General description							
Building	Category	Year of construction	Area [m2]	Ownership	residents/ employees [#]	Res above 13y/ Other Users [#]	
Furuset senter: kjøpesenter, bibliotek, svømmehall	Cultural building	1960	3500	Private	5		100
Furuset senter: kjøpesenter, bibliotek, svømmehall	Comercial building	1960	6500	Private	60		200
Furuset senter: kjøpesenter, bibliotek, svømmehall	Office building		9600	Private			
Furustien barnehage, Parkering	Kindergarten		400	Public			
Papyrusbygget: lager og kontorer. (Huser bla Dekkm	Office building		4000	Private			
Papyrusbygget: lager og kontorer. (Huser bla Dekkm	Comercial building		600	Private			
Papyrusbygget: lager og kontorer. (Huser bla Dekkm	Industry/Workshop		12400	Private			
Furuset forum: Ishall, håndballhall, noen kontorer	Sports Facility		16500	Public			
Scala barnehage, friområde	Kindergarten		600	Public			
Bakers bakeri (produksjon), Først laboratorium	Office building		3600	Private			
Bakers bakeri (produksjon), Først laboratorium	Industry/Workshop		3600	Private			
Suveren rørmøbelfabrikk	Industry/Workshop		4800	Private			
Øvre Furuset borettslag, byggeår 1980, planlegger c	Residential apartment building		22700	Private	505		
Nordre Gran borettslag, byggeår 1978, opprusting ut	Residential apartment building		32300	Private	719		
Granstangen borettslag, byggeår 1979, opprusting f	Residential apartment building		17400	Private	387		
Granstangen borettslag, byggeår 1979, opprusting f	Residential apartment building		22000	Private	489		
Gransletta borettslag, byggeår 1978, opprusting ute	Residential apartment building		9100	Private	202		
Gransletta borettslag, byggeår 1978, opprusting ute	Residential apartment building		9900	Private	220		
Gransletta borettslag, byggeår 1978, opprusting ute	Office building		6000	Private			
Gransletta borettslag, byggeår 1978, opprusting ute	Comercial building		2000	Private			
Kurland borettslag, byggeår 1978, fasader pusset op	Residential apartment building		34500	Private	768		
Ulsholt borettslag, byggeår 1978, fasader pusset op	Residential apartment building		22900	Private	509		
Lager	Industry/Workshop		26500	Private			
Furuset sykehjem	Nursing home		9300	Public			
Ny Gran ungdomsskole (bygges nå, FutureBuilt-pro	Kindergarten		4100	Public			
Ahmadiyya-moskeen	Cultural building		4000	Private			
Furuset skole	School		10000	Public			
Gran skole	School		8000	Public			
Kurland barnehage	Kindergarten		500	Public			
Del av Furuset senter	Office building		11500	Private			
Del av Furuset senter	Sports Facility		3000	Private			
Moske, næringsbebyggelse	Cultural building		1000	Private			



Infrastructure						
General description				Energy performance		
Outdoor lighting	Year of installation	# units		Energy performance Category	Energy consumption [kWh/unit]	
Lighting	1980	1000		Low efficiency	550	
Snow Melt Systems	Year of installation	Size [m2]		Energy performance Category	Energy consumption [kW/m2]	Efficiency/COP [-]
Snow Melt	1980	500		Low efficiency	350	0,9

Local energy plant									
Energy Source				Heating to District Heating system		Cooling to District Cooling system		Electricity to grid	
Type	Energy Source	CO2 Emission [g/kWh]	Efficiency [%]	Capacity [kW]	Production [kWh]	Capacity [kW]	Production [kWh]	Capacity [kW]	Production [kWh]
CHP	Pellets	19	85 %	400	2500000			200	1250000
Solar PV	Sun	0	100 %					500	500000



Steg 3 – Baseline scanario

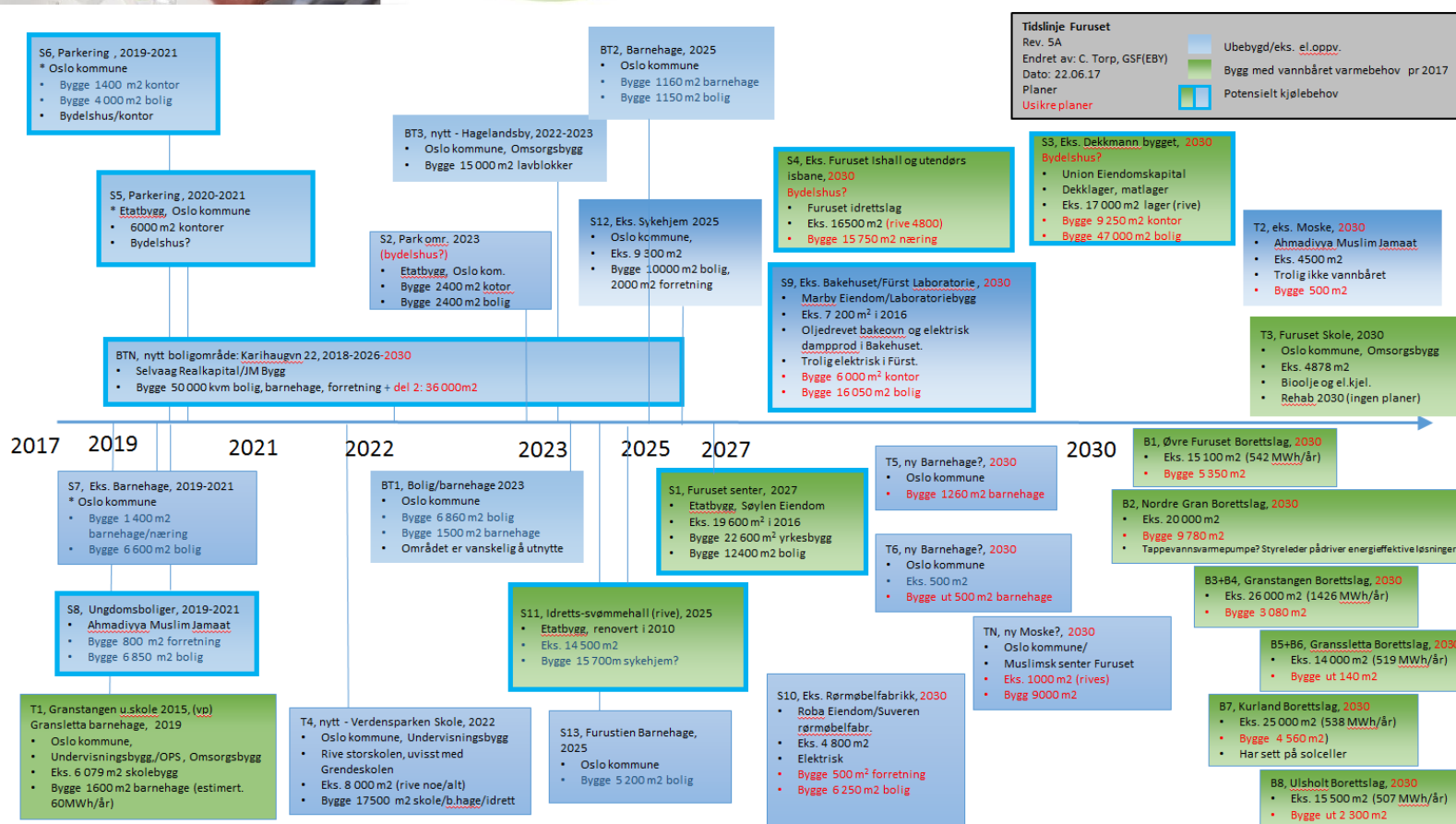
PI-SEC KPI planning TOOL
Front Page

Neighbourhood:
Furuset

Key data, goals and indicators									
KEY DATA		Now End of project							
Project timeframe		2015 2030							
Population									
Number of jobs									
Area									
Number of buildings									
Area of buildings									
GOALS	Add	Remove	KPI	Unit	Comparison	Relative to Goal at EoP			
Energy Consumption			Energy use total	/m2 BRA	% Reduction	Baseline	20		
Energy Consumption			Electricity consumption total	/inhabitant	Absolute		10000		
Carbon Emission			Energy/buildings	/inhabitant	% Reduction	Baseline	50		
Energy Generation			RES produced Electricity	/inhabitant	Absolute	Initial	200		
Menu									
Create Baseline			Calculate Project						
Create Scenario									



Steg 3 – Baseline scenario

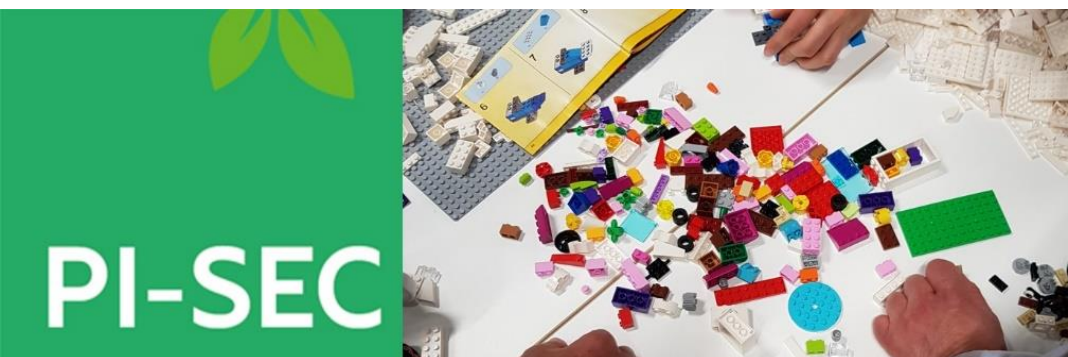


PI-SEC



Steg 3 – Baseline scanario

PI-SEC KPI TOOL		Baseline	2030	
Neighbourhood		Furuset		
Buildings	Add	Upgrade	Demolish	
General description				
Building	Category	Year of constr.	Area [m2]	Ownership
Furuset farum: Ishall, håndballhall, noen kontorer	Sports Facility		11700	Public
Øvre Furuset barottrik, byggeår 1980, planlagt opprulling	Residential apartment building		22700	Housing cooperative
Nordre Gran barottrik, byggeår 1978, opprulling utearealer 2012, farader 2013	Residential apartment building		32300	Housing cooperative
Granstangen barottrik, byggeår 1979, opprulling farader og utearealer 2009- 2012	Residential apartment building		17400	Housing cooperative
Granstangen barottrik, byggeår 1979, opprulling farader og utearealer 2009- 2012	Residential apartment building		22000	Housing cooperative
Granlotta barottrik, byggeår 1978, opprulling utearealer 2009	Residential apartment building		9100	Housing cooperative
Granlotta barottrik, byggeår 1978, opprulling utearealer 2009	Residential apartment building		9900	Housing cooperative
Granlotta barottrik, byggeår 1978, opprulling utearealer 2009	Office building		6000	Private
Granlotta barottrik, byggeår 1978, opprulling utearealer 2009	Commercial building		2000	Private
Kurland barottrik, byggeår 1978, farader puzet opp i 2006	Residential apartment building		34500	Housing cooperative
Ulthelt barottrik, byggeår 1978, farader puzet opp i 2005	Residential apartment building		22900	Housing cooperative
Lager	Industry/Workshop		26500	Private
Ny Gran ungdomsskole (bygges nå, Future Built-prosjekt)	School		4100	Public
Ahmediyya-markoen	Cultural building		4200	Private
Furuset skole	School		10000	Public
Kurland barnehage	Kindergarten		500	Public
S2 (kontor)	Office building		2400	Private
S3 (kontor)	Office building		9250	Private
S5 (kontor)	Office building		5000	Private
S6 (kontor)	Office building		1400	Private
S9 (kontor)	Office building		6000	Private
B1-6 (baliq)	Residential apartment building		25210	Housing cooperative
BT1 (baliq)	Residential apartment building		6860	Housing cooperative
BT2 (baliq)	Residential apartment building		1150	Housing cooperative
BTN1 (baliq)	Residential apartment building		46800	Housing cooperative



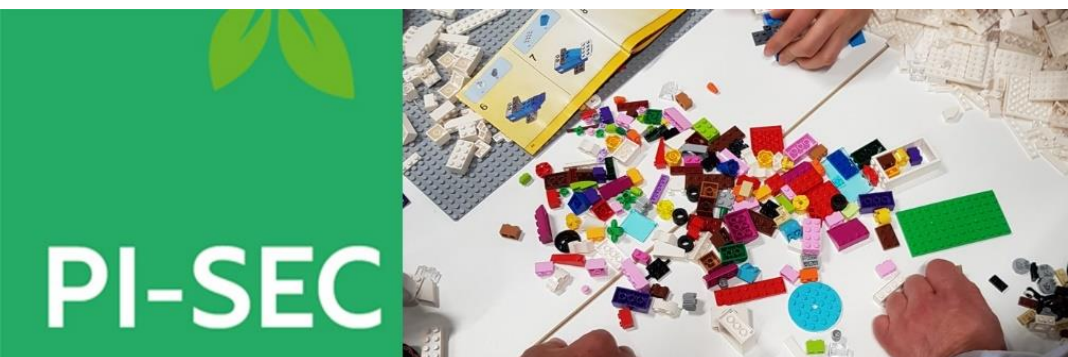
District Heating

Energy Source		Distribution			
Heat Source	Coverage [%]	CO2 Emission [g/kWh]	Production efficiency [%]	Distribution losses	
Electricity	28,2 %	123	0,95		
Heat Pump	7,9 %	123	3,125		
Solar Collector		0	1		
Waste Heat		0	0,9		
Waste Incineration	57,6 %	11	0,9		
Wood Chips		18	0,9		
Pellets	1,7 %	19	0,9		
Bio-oil	3,6 %	10	0,9		
Bio-gas		10	0,9		
Fossile Oil	0,2 %	268	0,9		
LPG	0,8 %	235	0,9		



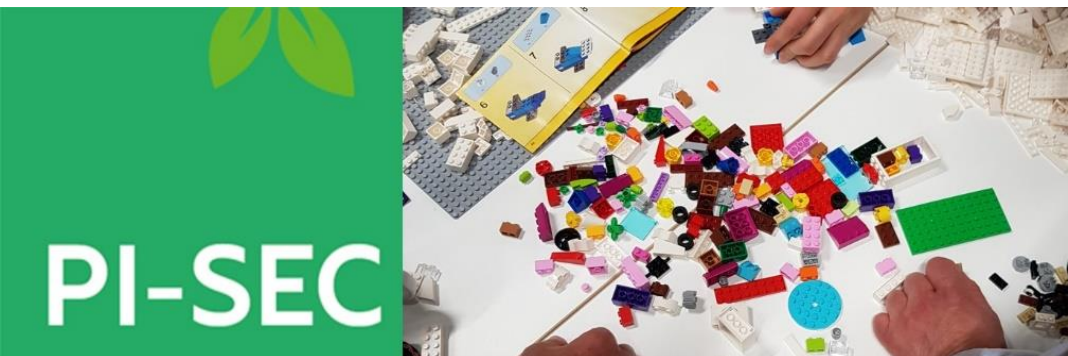
Steg 4 – Utviklings scenarier

PI-SEC KPI planning TOOL										Front Page									
Neighbourhood:										Furuset									
Key data, goals and indicators																			
KEY DATA										Now End of project									
Project timeframe										2015 2030									
Population																			
Number of jobs																			
Area																			
Number of buildings																			
Area of buildings																			
GOALS										Add Remove									
KPI										Unit Comparison Relative to Goal at EoP									
Energy Consumption										Energy use total /m2 BRA % Reduction Baseline 20									
Energy Consumption										Electricity consumption total /inhabitant Absolute 10000									
Carbon Emission										Energy/buildings /inhabitant % Reduction Baseline 50									
Energy Generation										RES produced Electricity /inhabitant Absolute Initial 200									
Menu																			
Create Baseline										Calculate Project									
Create Scenario																			



Steg 4 – Utviklings scenarioer

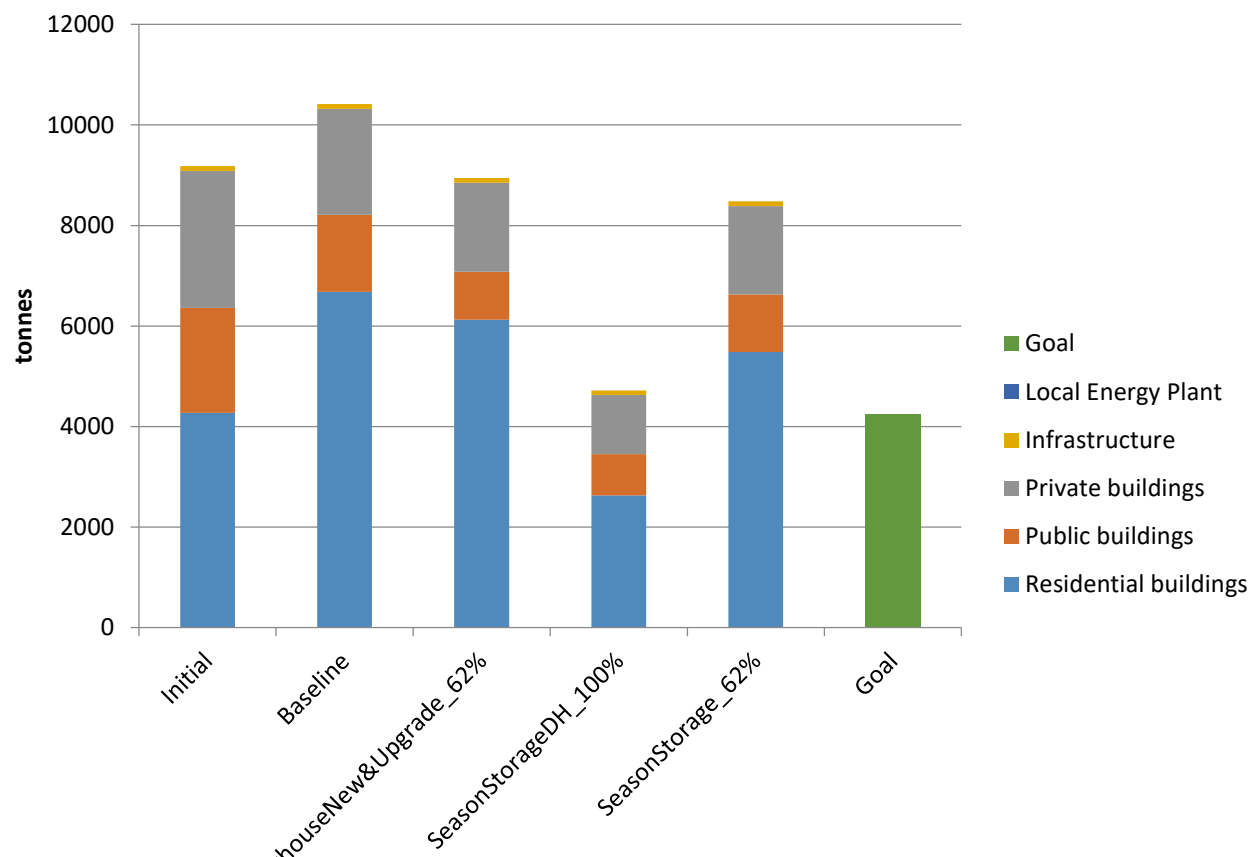
District Heating					
Energy Source					Distribution
Heat Source	Coverage [%]	CO2 Emission [g/kWh]	Production efficiency [%]	Distribution losses	
Electricity	0,0 %	123	0,95	10 %	
Heat Pump	0,0 %	123	3,125		
Solar Collector		0	1		
Waste Heat		0	0,9		
Waste Incineration	100,0 %	0	0,9		
Wood Chips		18	0,9		
Pellets	0,0 %	19	0,9		
Bio-oil	0,0 %	10	0,9		
Bio-gas		10	0,9		
Fossile Oil	0,2 %	268	0,9		
LPG	0,8 %	235	0,9		



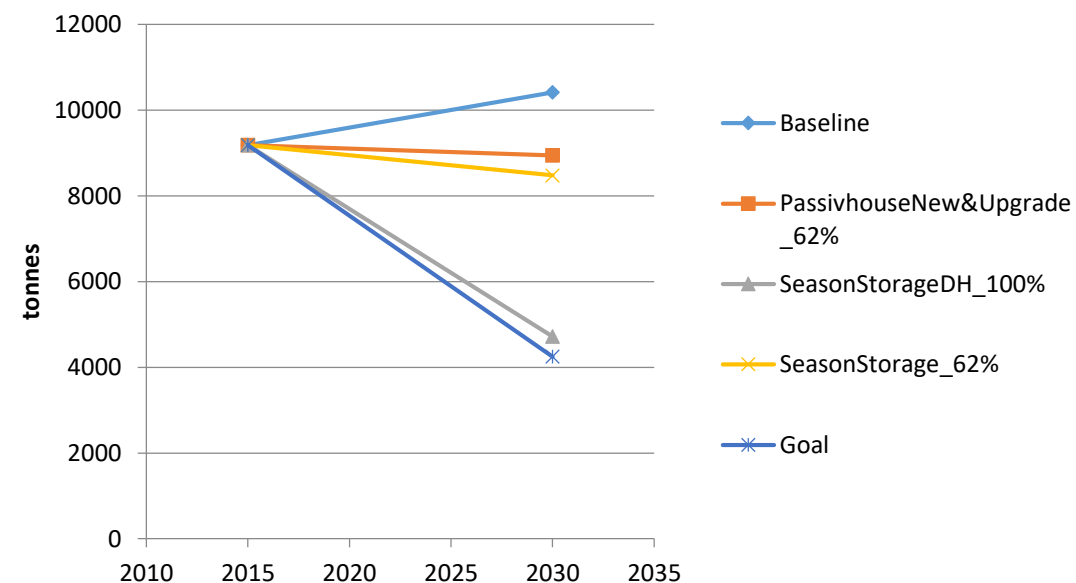
Steg 5 – Kalkulering & analyse

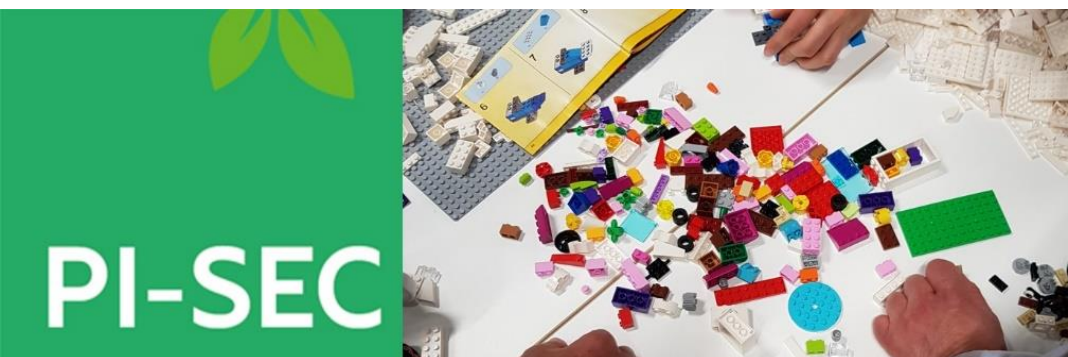
Steg 6 – Indikatoroppfølging

CO2 emissions: Total



CO2 emissions: Total

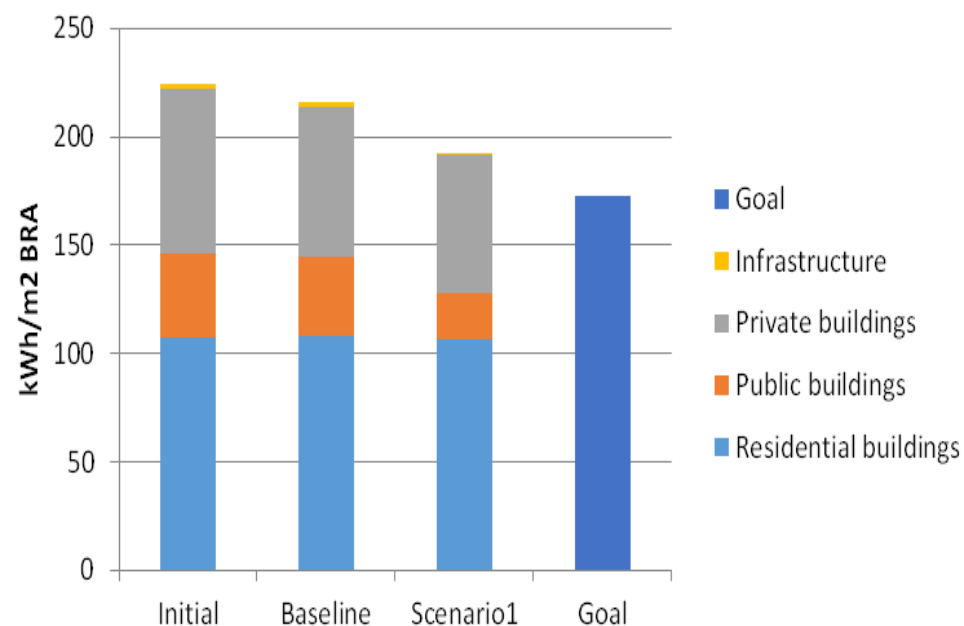




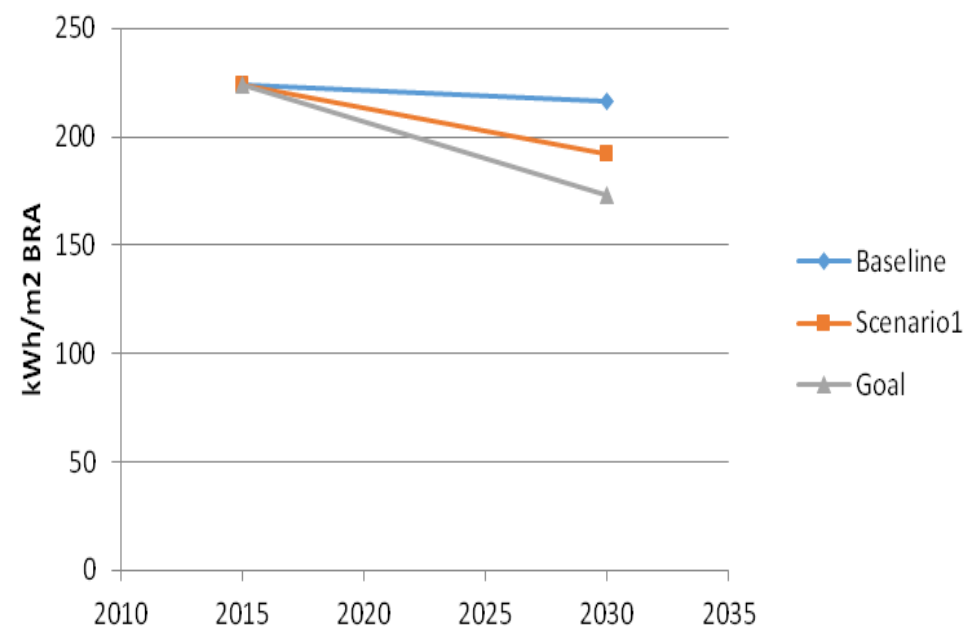
Steg 5 – Kalkulering & analyse

Steg 6 – Indikatoroppfølging

Energy Consumption: Energy use total



Energy Consumption: Energy use total

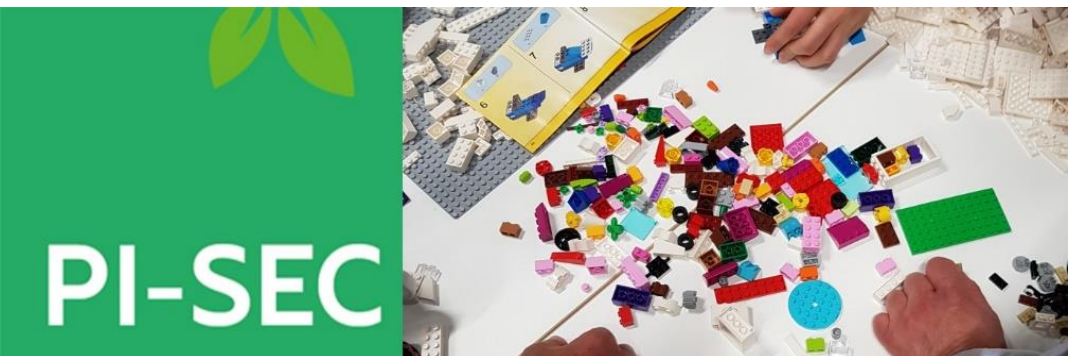




PI SEC planning tool

Videre utvikling

- WEB basert
- Koblet opp mot en GIS plattform



Indikatorer og PI SEC planning tool

Noen umiddelbare tanker ?