ALDREN RenoMap

Renovation Roadmap

ALDREN ALliance for Deep RENovation in buildings

CSTB le futur en construction

CertiVéA

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ALDREN RenoMap – Context and Objectives

EPBD - Feasibility study 19a – Art 2, 10, 20

→ Tool to support building owners in short and long-term strategy to renovate their buildings

→ **Multi-criteria decision support in the early phases of a renovation**
Shaping the coming project and avoiding lockin effect

→ **Hindsight on building potential and global pathway**

Renovation projects = events triggering a new way to manage building life cycle

Piece of ALDREN BRP : for building managers and owners
Applied by project management assistance / ALDREN assessor

ALDREN RenoMap – Methodology

PROTOCOL

BRP_M7

- Owner's upstream interview
- Detailed audit
- Definition of Elementary Renovation Actions
- Owner's final interview
- Evaluation of Elementary Renovation Actions

BRP_M8

- Reference states calculation and evaluation
- Processing of renovation strategy
- Evaluation of primary renovation packages
- Selection of intended immediate renovation

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Two levels of multi-criteria evaluation :

Priority	Qualitative criteria
1a	Existing components obsolescence
1b	Owner will
2	Economic benefit
3	Energy performance improvement
-	Technical constraints and interactions

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→ **Consistent roadmap proposal for short and long-term renovation management**

Two levels of multi-criteria evaluation :

Priority	Qualitative criteria
1a	Existing components obsolescence
1b	Owner will
2	Economic benefit
3	Energy performance improvement
-	Technical constraints and interactions

ALDREN quantitative indicators

- Final and Primary energy consumption
  Standard [EPBD uses] or actual conditions
- Financial indicators
  Investment Cost, IC/AV, ES/IC, Global Cost
- IEQ indicators
  PredicTAIL framework

ALDREN RenoMap – Results and outcomes

→ List of NZEB compliant Elementary Renovation Actions

Qualitative multi-criteria assessment

				Obsolescence (1a/4)		Owner will (1b)		levels		Economics (2)		Energy efficiency (3)	verify IEQ & interactions (1-4)
										cf. Table A			cf. Table B
ERA #	Elementary Renovation Actions	ERAS' conception settings	Current state of the related component	Priority	Period (yr)	Decision	Time or opportu			Investment cost (k	typical return on investme	Upgrade of the component	
E.	**ENVELOPE**												
E.1	**Thermal insulation of external walls**												
E.1.A	External walls, additional internal insulation	18 cm Glass wool U= 0,17W/m².K	4 cm Insulation U= 1,19W/m².K	1		0	3	2	4	2271	*	**	
E.2	**Thermal insulation of roof surfaces**												
E.2.A	Roof additional insulation	14cm polyurethane U=0,17W/m².K	10 cm Isolant U= 0,29W/m².K	1		0	3	3	4	44	*	*	
E.3	**Thermal insulation of bottom floor surfaces**												
E.4	**Thermal bridges treatment : Facades to roof**												
E.5	**Thermal bridges treatment : Windows to walls**												
E.6	**Windows replacement**												
E.6.A	Triple glazing high efficiency	Triple glazing - U=0,8 W/m².K	Low perf double glazing - U = 3W/m².K	1		0	3	2	4	4467	*	**	
E.7	**Doors replacement**												
E.8	**Integration of a double-door entrance**												
E.9	**Blinds and solar protections**												
E.9.A	Shading device and control	External semi-automatic shading device	none	1		0	3	1	4	101	**	***	
E.10	**Envelope air tightness treatment**												
E.10.A	Air tightness treatment	Correction of infiltration		1		0	3	2	4	308	No data	No data	
V.	**VENTILATION**												
V.1	**Ventilation : Ventilation system replacement**												
V.1.A	Central ventilation system / double-flow	Central ventilation system / double-flow	Old Central ventilation system / double-flow (no pre-heating)	2		0	3	3	4	1290	*	*	
V.2	**Ventilation : Controls**												
V.2.A	Ventilation regulation	optmised ventilation control	None	0		0	3	1	4	5	***	***	
H.	**HEATING**												
H.1	**Heating : Heat generation system replacement**												
H.2	**Heating : Distribution network replacement**												
H.3	**Heating : Thermal insulation of distribution network**												
H.3.A	Thermal insulation replacement	Class 4	Class 3	2		0	3	3	4	20	*	*	
H.4	**Heating : Emission systems replacement**												
H.5	**Heating : Controls**												
H.5.A	Control : Heating	Automatic management	Thermostats	0		0	3	3	4	5	*	*	
C.	**COOLING**												

ALDREN RenoMap – Results and outcomes

→ List of NZEB compliant Elementary Renovation Actions

Qualitative multi-criteria assessment

→ Current situation and final renovation potential

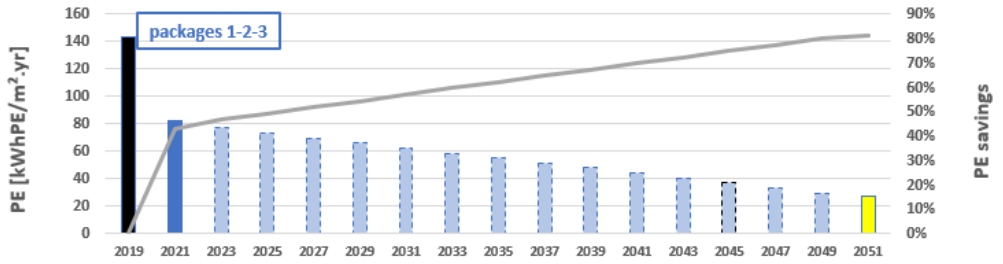
Positioning the coming project against the building reference states

Summary

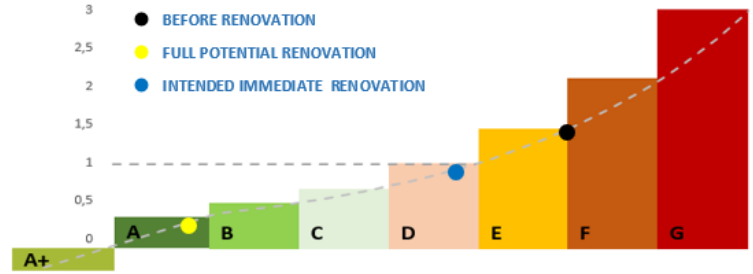
	Energy performance: Final energy consumption [KwhFE/m².y] STANDARD USES: heating	cooling	ventil.	DHW	lighting	aux.	other 1...	Ren. prod.	TOTAL ENERGY USE		Standard evaluation: Primary energy consumption [KwhPE/m².y] STANDARD USES: EPBD USES		LABEL	Cost indicators: INVESTMENT COST (IC) [k€]	ENERGY SAVINGS/IC [kWh/k€]	IC/ASSET VALUE [%]	GLOBAL COST [k€-%]	IEQ-TAIL: I - Thermal Comfor +	L - Visual comfort
BEFORE RENOVATION	107,6	4,3	4,9	1,1	23,6	1,8	-	0	143,3		184,1		F						
INTENDED IMMEDIATE RENOVATION	47,3	5,4	3,2	1,1	23,6	1,5	-	0	82,1	43%	120,3	35%	D	1653	995				
FULL POTENTIAL RENOVATION	13,5	6,3	3,2	1,1	4,3	1,5	-	-2,6	27,3	81%	37,0	80%	A	9253	410				

*electricity, *District Heating/Cooling, ...

Long-term trajectory



Standard energy labels



ALDREN RenoMap – Results and outcomes

→ List of NZEB compliant Elementary Renovation Actions

Qualitative multi-criteria assessment

→ Current situation and final renovation potential

Positioning the coming project against the building reference states

→ Primary renovation packages / Long-term tineline

Gathering of consistent and prioritized renovation action for decision support

Primary renovation packages

PRIORITY LEVEL	#	RENOVATION ACTIONS	REPLACEMENT PERIOD / OPPORTUNITY	MOTIVATIONS	Energy performance – Final energy consumption [KwhFE/m².y] – STANDARD USES: heating	cooling	ventil.	DHW	lighting	aux.	other 1...	Ren. prod.	TOTAL ENERGY USE		Standard evaluation – Primary energy consumption [KwhPE/m².y] – STANDARD USES: EPBD USES		LABEL	Cost indicators: INVESTMENT COST (IC) [k€]	ENERGY SAVINGS/IC [kWh/k€]	IC/ASSET VALUE [%]
1a-1b	H.3.A	Thermal insulation replacement	change of Owner	Immediate need of works	47,3	5,4	3,2	1,1	23,6	1,5	-	0,0	82	43%	120,3	35%	D	1653	995	0,7%
	H.5.A	Control : Heating	change of Owner	Interaction opportunity																
	C.3.A	Thermal insulation replacement	change of Owner	Immediate need of works																
	C.5.A	Control : Cooling	change of Owner	Interaction opportunity																
	V.1.A	Central ventilation system / double-flow	change of Owner	Immediate need of works																
	E.10.A	Air tightness treatment	change of Owner	Interaction opportunity																
	V.2.A	Ventilation regulation	change of Owner	Interaction opportunity																
+2	L.1.A	Offices floors complete replacement	change of Owner	high return on investment	58,1	3,3	3,2	1,1	4,7	1,5	-	0,0	72	50%	87,7	52%	C	357	2358	0,1%
	L2..A	Lighting controls : Offices floors	change of Owner	Interaction opportunity																
	L.1.B	Ground floor specific replacement	change of Owner	high return on investment																
	L.2.B	Lighting controls : Ground floor	change of Owner	Interaction opportunity																
+3	E.9.A	Shading device and control	change of Owner	high energy gains	13,5	6,3	3,2	1,1	4,3	1,5	-	-2,6	27	81%	42,4	77%	A	7234	159	2,9%
	E.6.A	Triple glazing high efficiency	change of Owner	Interaction opportunity																
	E.1.A	External walls, additional internal insulation	change of Owner	Interaction opportunity																
	E.2.A	Roof additional insulation	change of Owner	Interaction opportunity																
	DHW.4.A	Low consumption taps/WC	change of Owner	Potentially immediate																
	Ren.1.A	PV on roof	change of Owner	high energy gains																