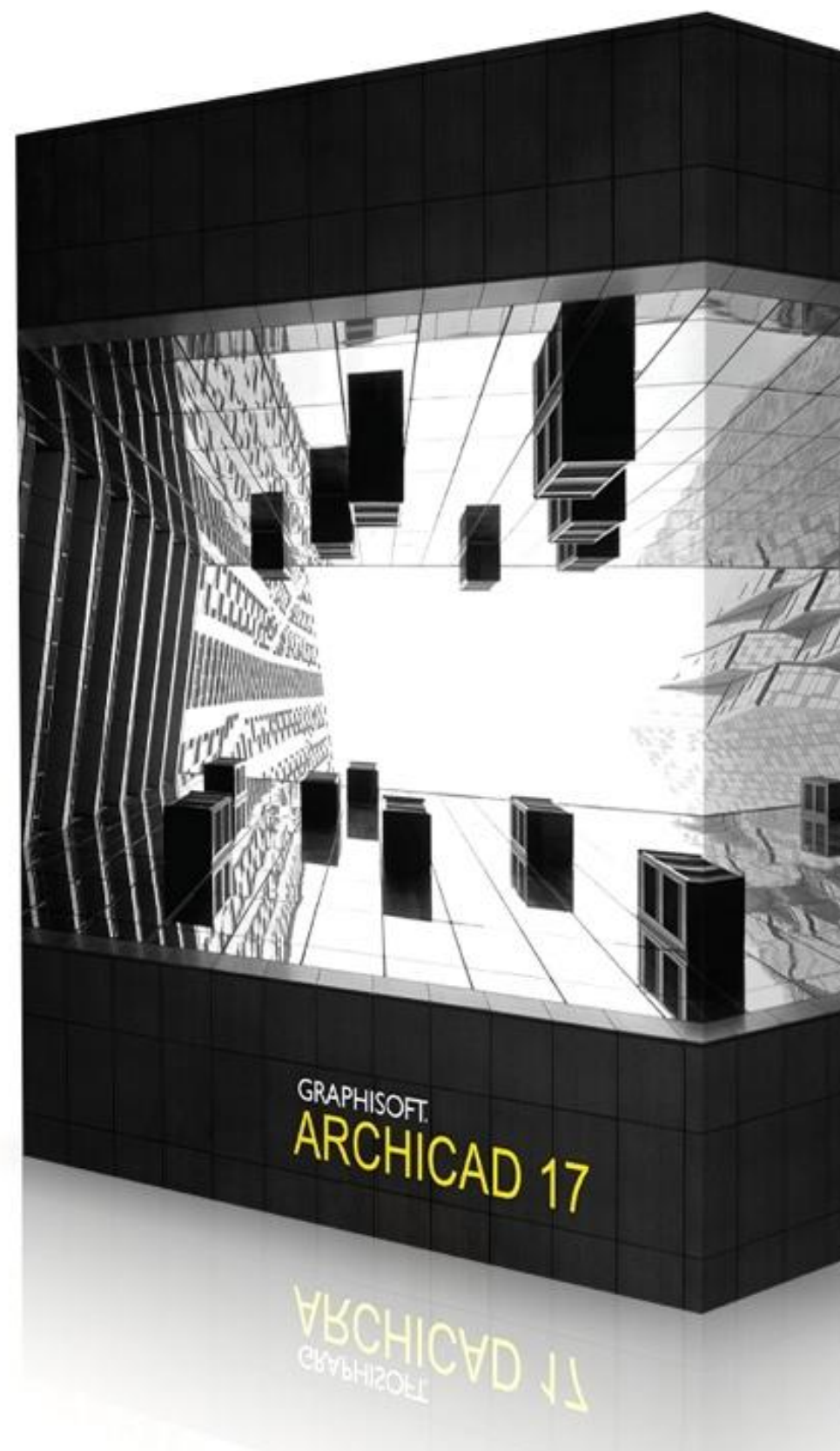
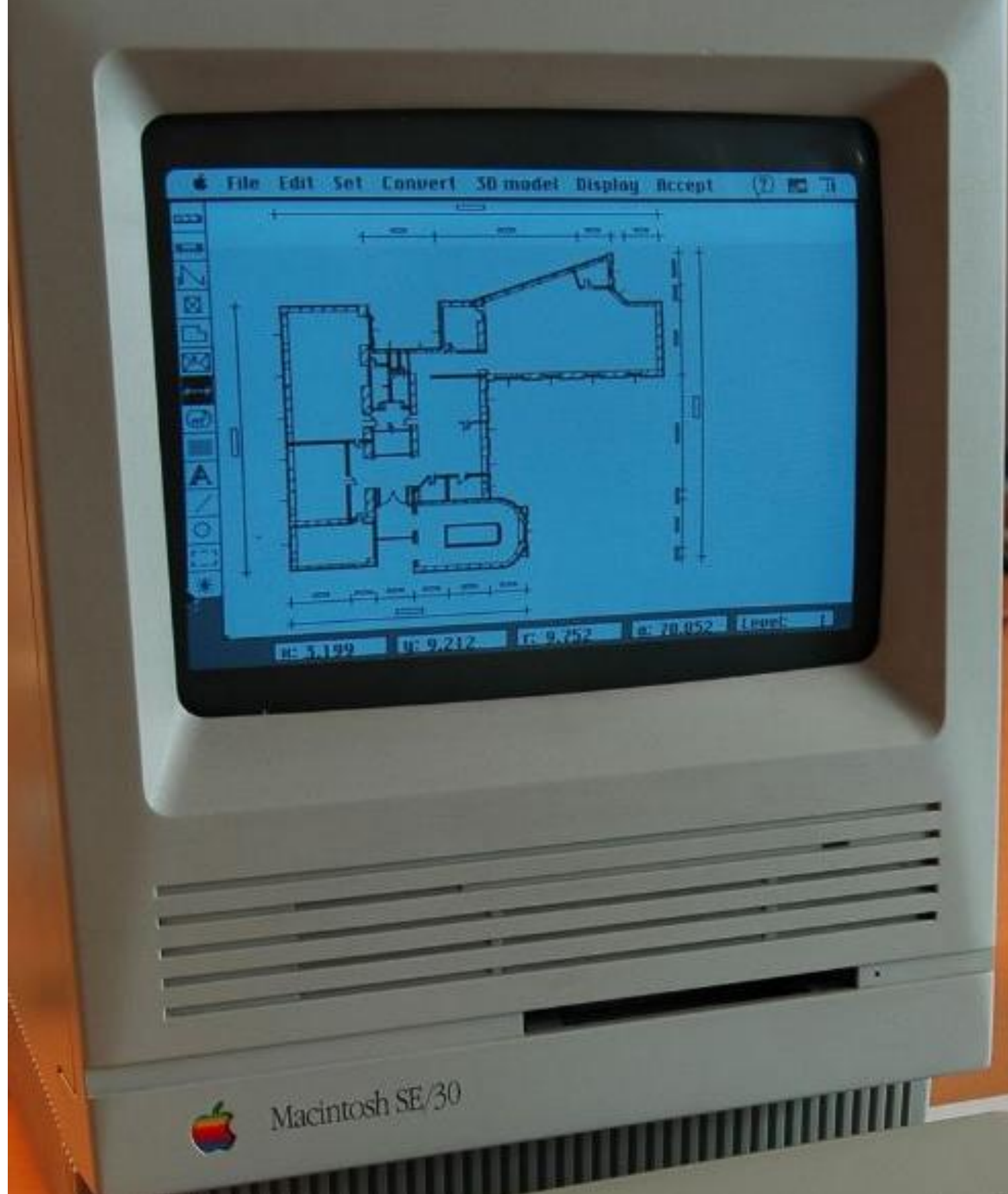
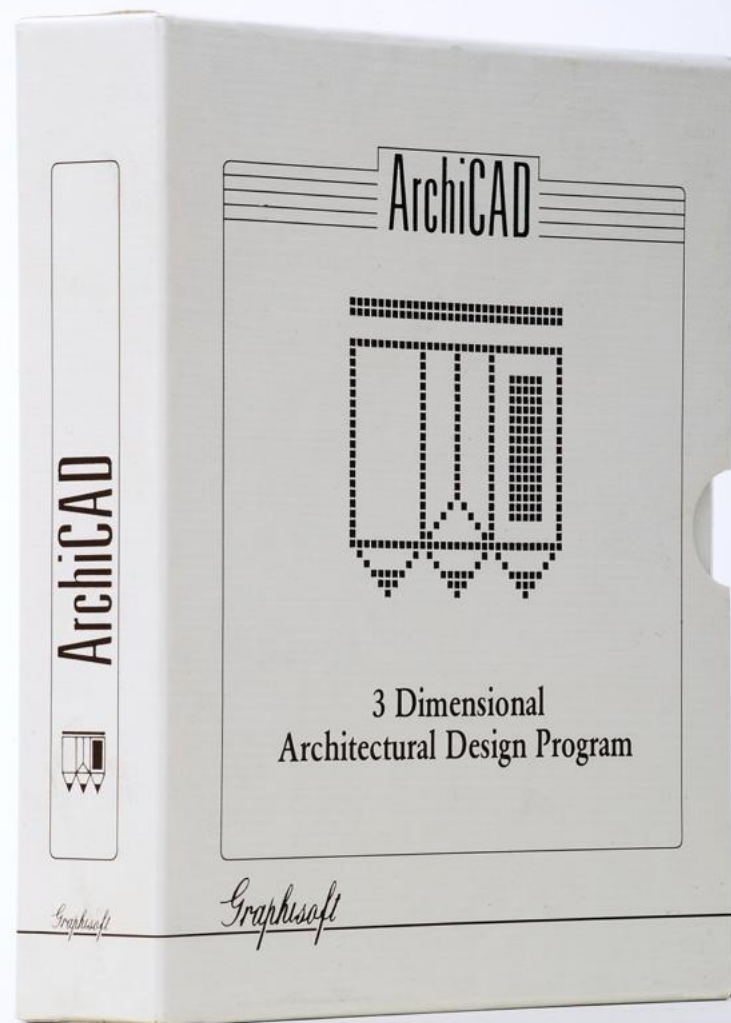




1984.

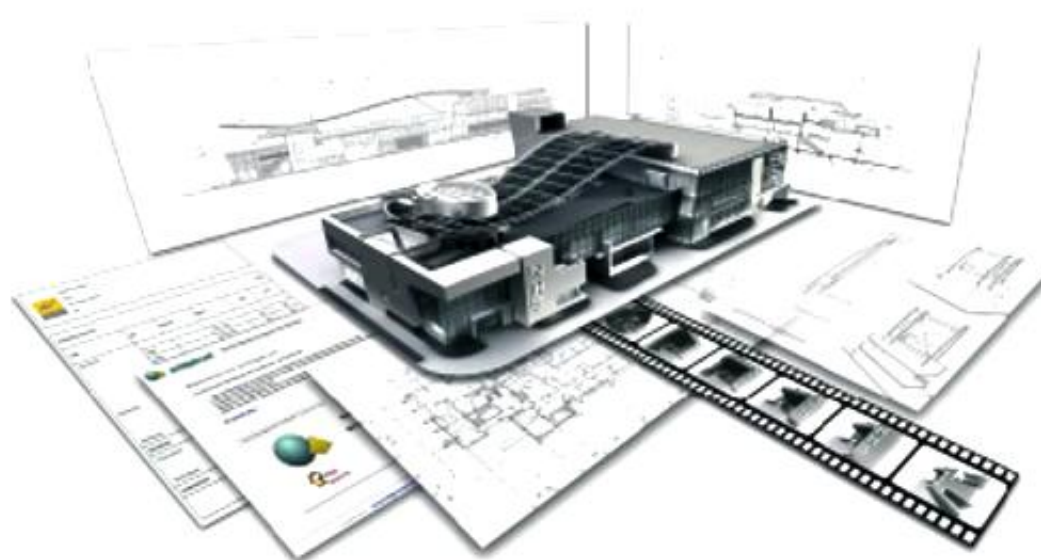




**First 3D CAD on
Personal Computers**

1982

1986



**Invention of the
Virtual Building™ Concept**

1990



**"B
CA**

19

Praksa danas... a i prije gotovo tri desetljeća

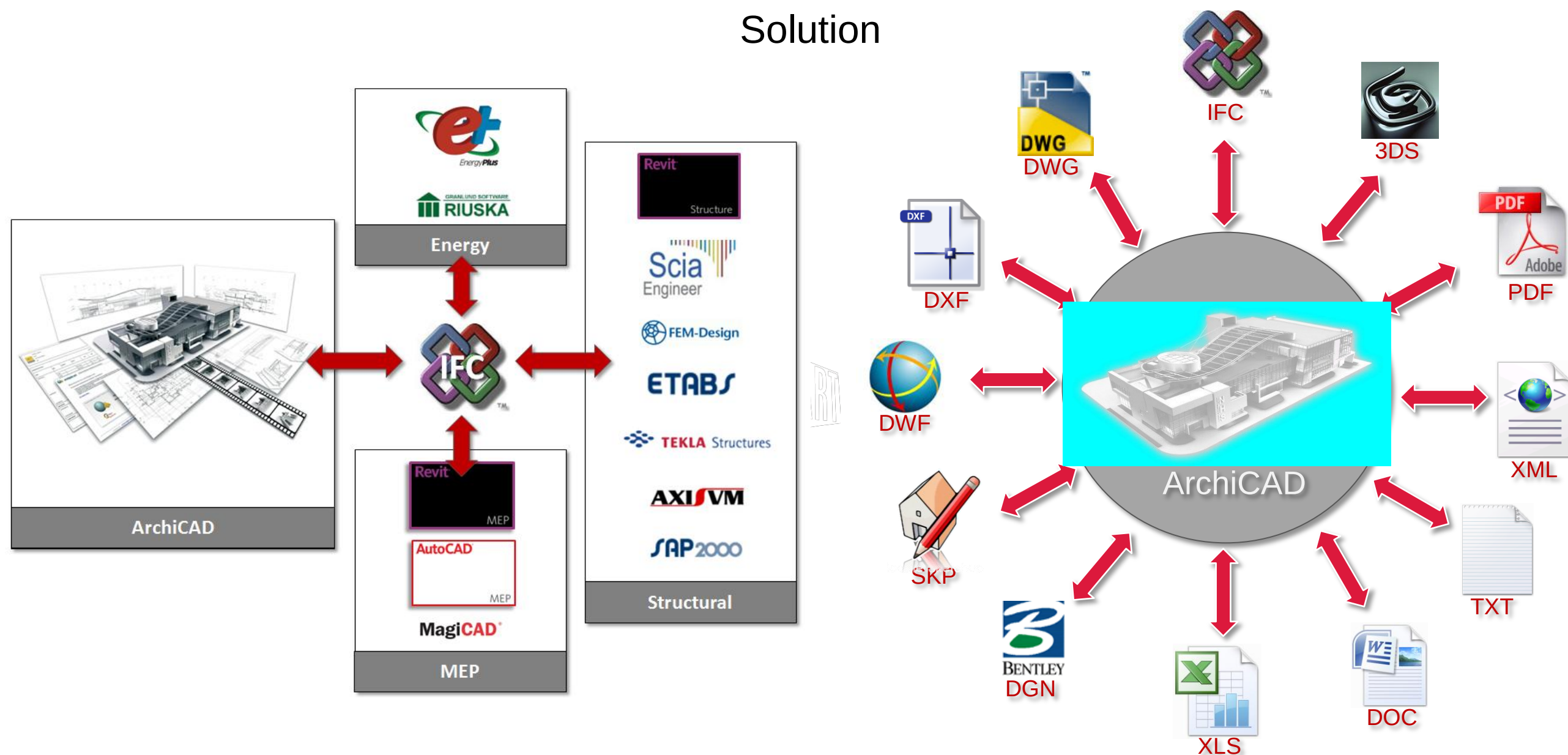


***Nemam vremena za prezentacije i
trgovinu – moram u bitku odmah!***

An

OPEN BIM

Solution

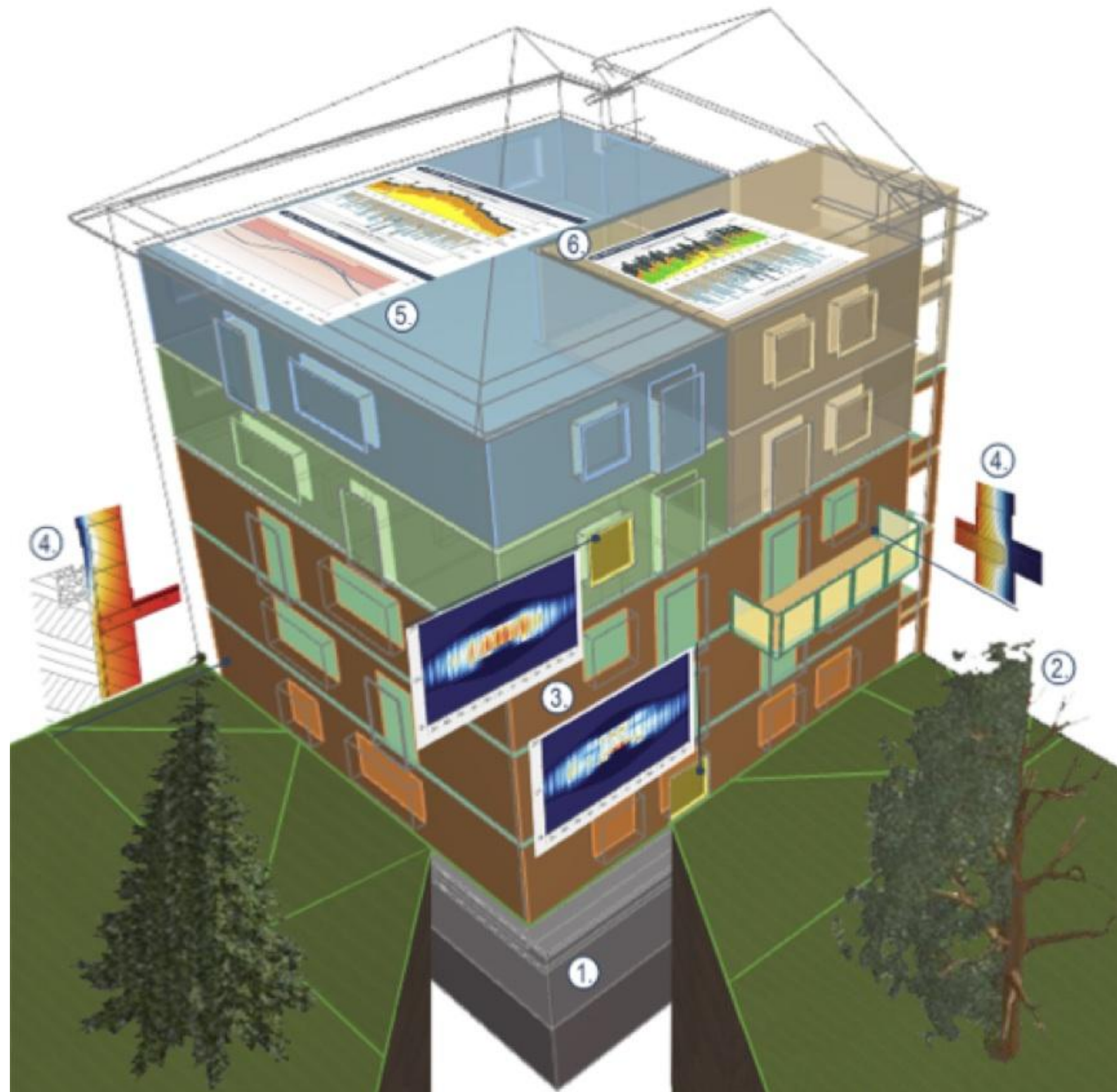


Birate li suradnike prema njihovom znanju ili softveru koji koriste?

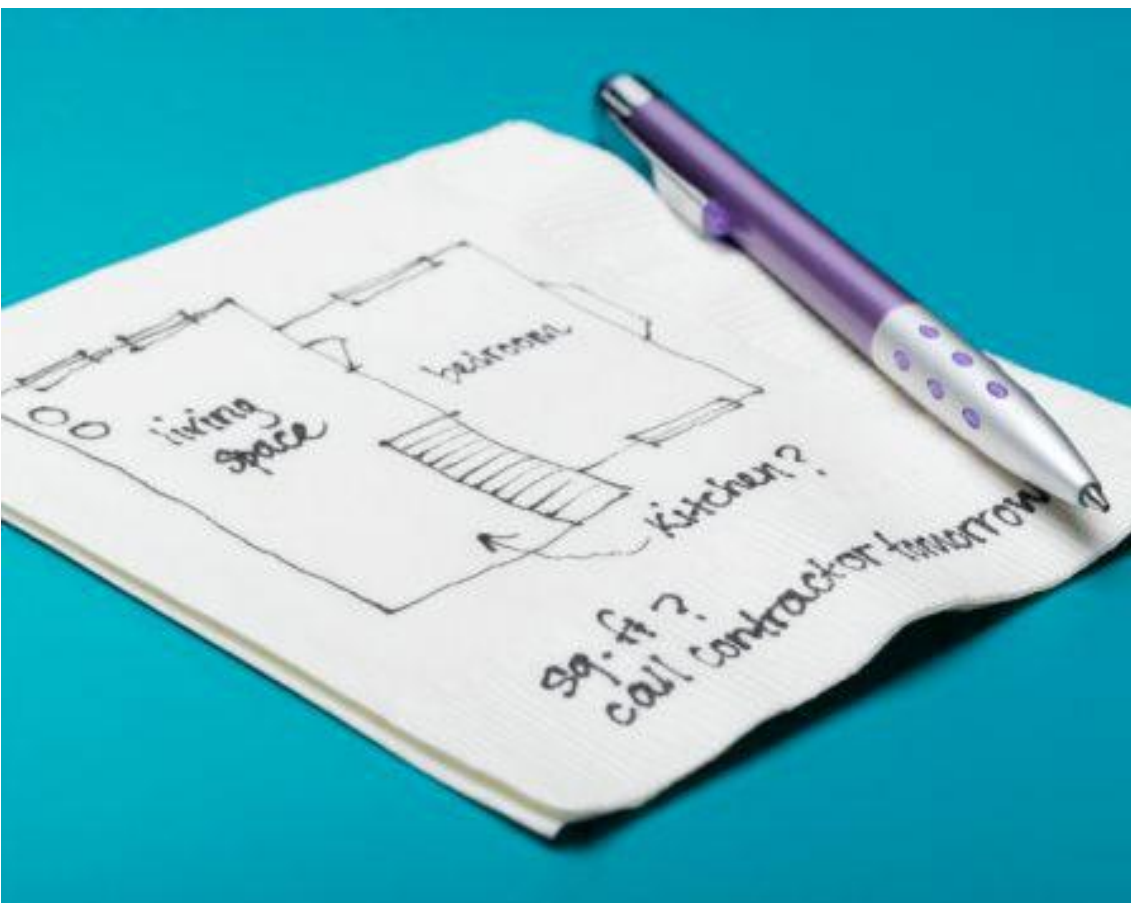


Ponašanje zgrade u korištenju

1. Energetska analiza
2. Bjelogorična vegetacija
3. Studija osunčanja iz modela
4. Simulacija hladnih mostova
5. Satni izračun temperature interijera
6. Zasebno mjerenje učinkovitosti različitih prostora



Tipični problem



80% odluka u vezi uštede energije donese se u najranijoj fazi projektiranja.

Konzultanti za energetske učinkovitost najčešće nisu prisutni u toj fazi.

Održivo projektiranje je budućnost u poslu s nekretninama - pitanje nije “trebamo li” nego “kada”.

Douglas Durst, predsjednik, The Durst Organization Inc.

ArchiCAD 17

Brza energetska procjena
(proračun potrebne energije)

1.
IDEJNI
PROJEKT

2.
GLAVNI
PROJEKT

3.
IZVEDBENI
PROJEKT

EcoDesigner STAR

Proračun sukladno standardima
(certificiranje)

1.
IDEJNI
PROJEKT

2.
GLAVNI
PROJEKT

3.
IZVEDBENI
PROJEKT

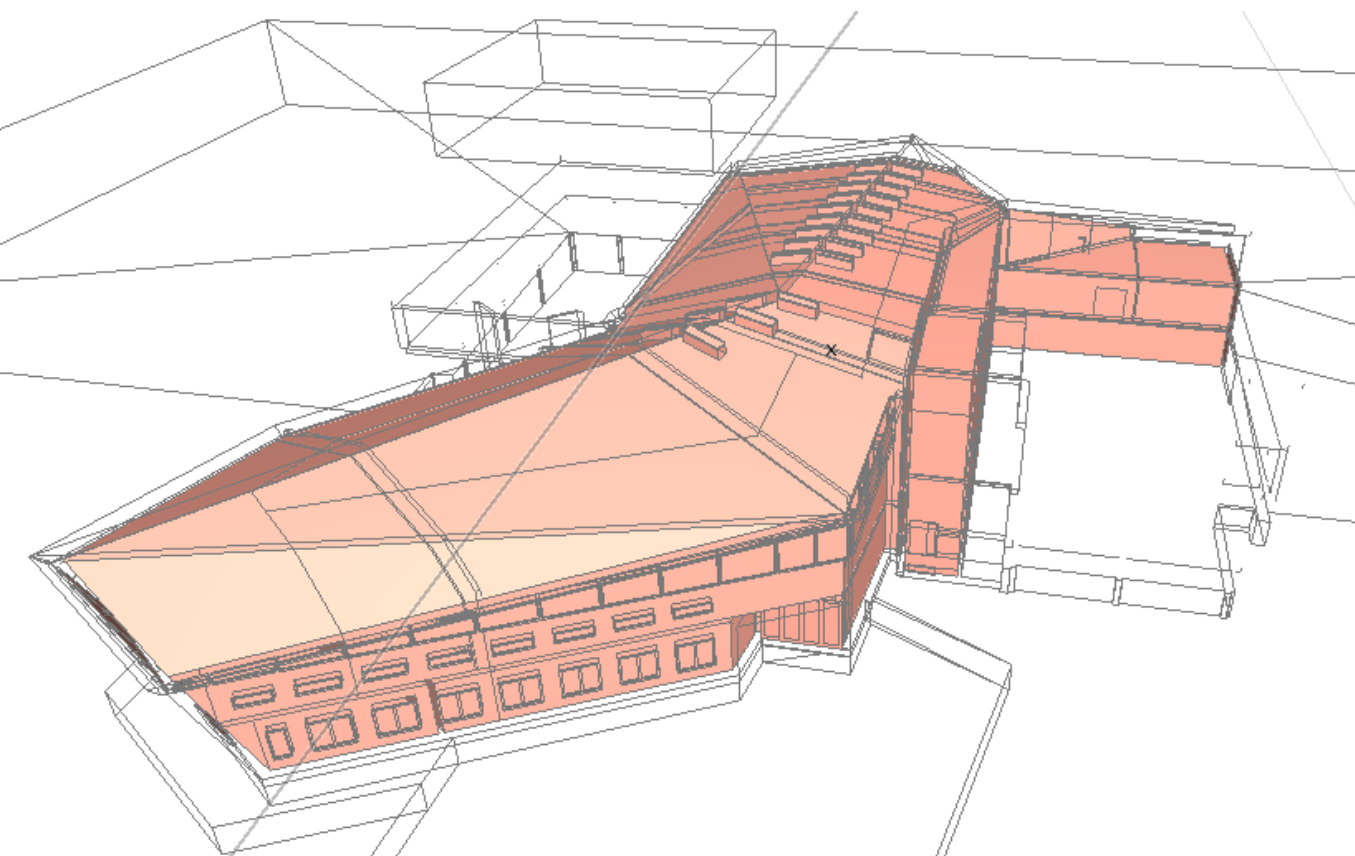
ArchiCAD

- brza energetska procjena,
- za arhitekte,
- za fazu projektiranja,
- olakšava donošenje projektantskih odluka
- dio standardne ArchiCAD licence

EcoDesigner STAR

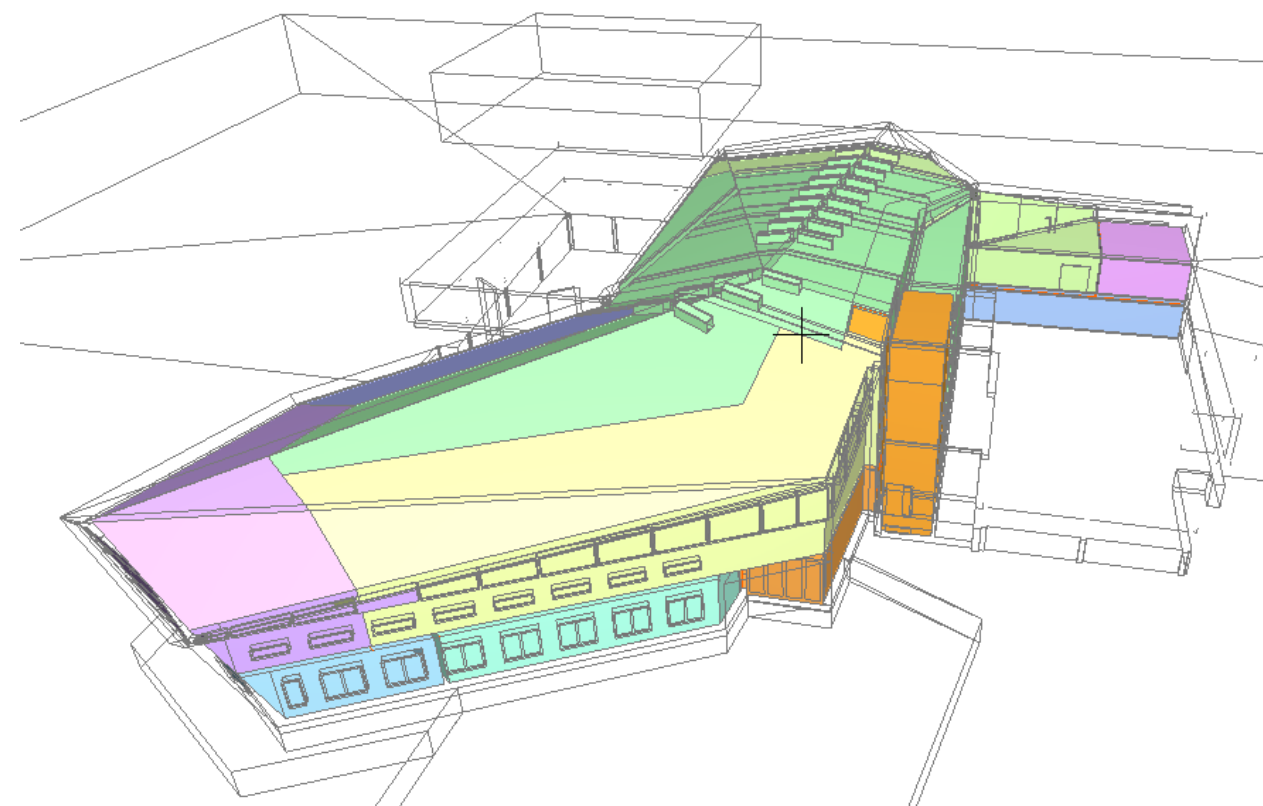
- brza energetska analiza, za arhitekte,
- za fazu razrade,
- za energetsku simulaciju sukladno međunarodnim standardima testiranja (ASHRAE 140).

Tipovi energetske modela zgrade



Energetska procjena:

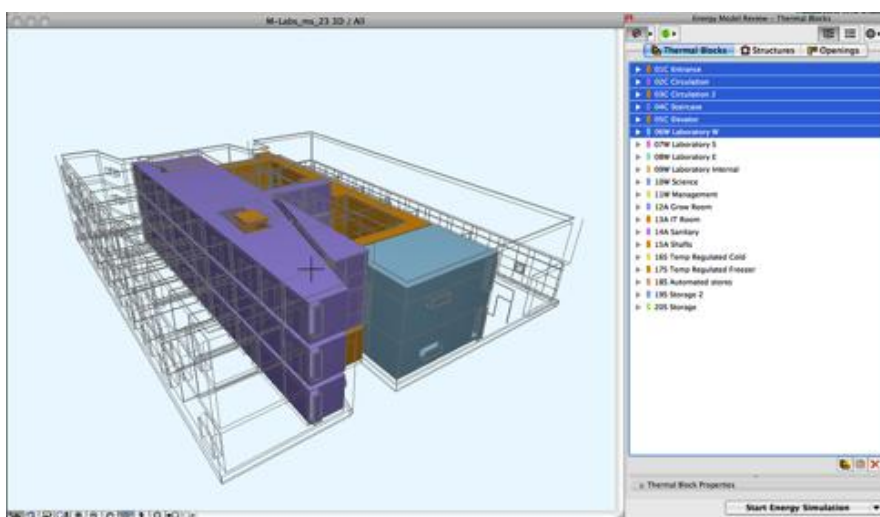
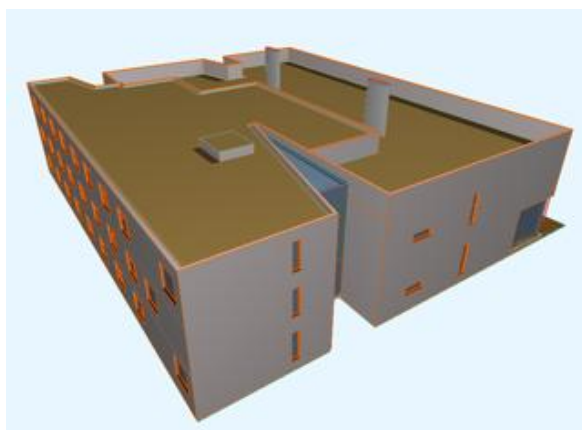
- jedan termalni blok
- pojednostavljen unos podataka



Energetska analiza:

- više termalnih blokova
- detaljan unos podataka
- dodatne funkcije proračuna
- iskaz učinkovitosti

Termalni blok - definicija

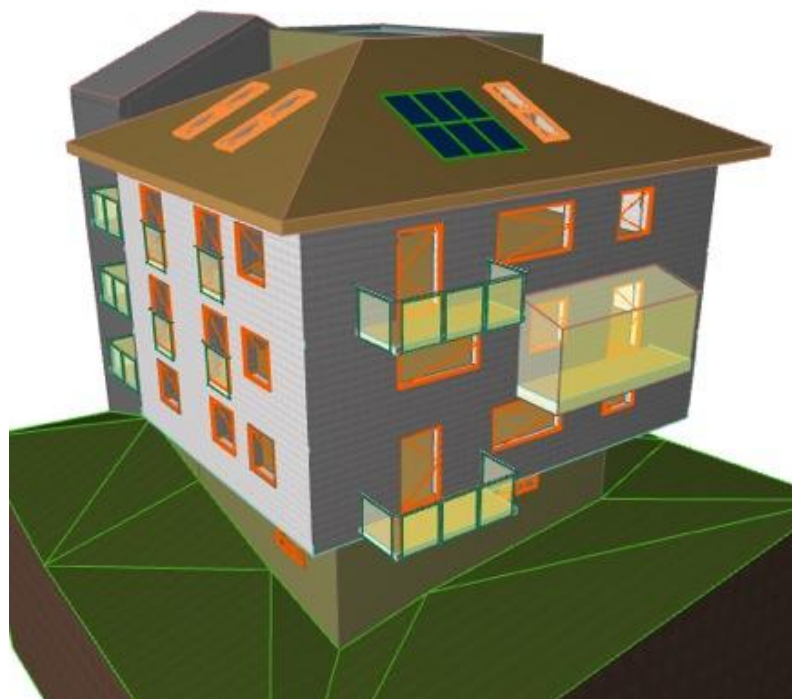


Thermal Blocks

ID	Name	Zones Assigned	Operation Profile	Gross Floor Area m ²	Volume m ³
03C	Circulation 2	5	M-Labs_Circulation	272.82	653.03
19S	Storage 2	3	M-Labs_Store room	52.56	128.28
18S	Automated stores	6	M-Labs_Store room	90.21	208.84
17S	Temp Regulated Freezer	4	M-Labs_Store room	70.36	174.38
06	Laboratory W	3	M-Labs_Laboratory	227.23	539.98
08	Laboratory E	6	M-Labs_Laboratory	309.93	720.56
07	Laboratory S	12	M-Labs_Laboratory	1355.39	3381.24
12A	Grow Room	2	M-Labs_Grow Room	35.58	96.58
16S	Temp Regulated Cold	3	M-Labs_Store room	35.22	94.01
13A	IT Room	1	M-Labs_IT Room	17.51	48.06
01C	Entrance	1	M-Labs_Circulation	9.49	24.93
05C	Elevator	5	M-Labs_Shifts	26.06	51.84
15A	Shafts	6	M-Labs_Shifts	10.76	24.35
04C	Staircase	3	M-Labs_Circulation	45.63	129.58
09	Laboratory Internal	4	M-Labs_Laboratory	58.49	160.21
14A	Sanitary	9	M-Labs_Toilets an...	104.77	282.28
10	Science	16	M-Labs_Office	527.69	1411.94
11W	Management	9	M-Labs_Office	263.54	703.70
02C	Circulation	23	M-Labs_Circulation	658.08	1898.89
20S	Storage	7	M-Labs_Store room	133.78	353.92
Total:		128		4305.11	11086.64

Skup prostoriya sličnog načina korištenja i orijentacije mogu se objediniti u jedan termalni blok za potrebe simulacije ukoliko su im sustavi grijanja/hlađenja identični.

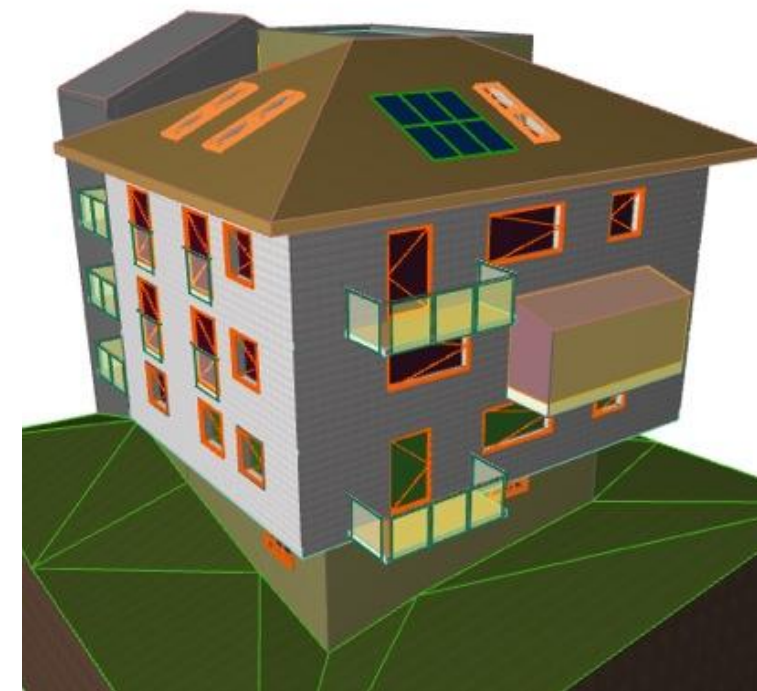
BIM → BEM



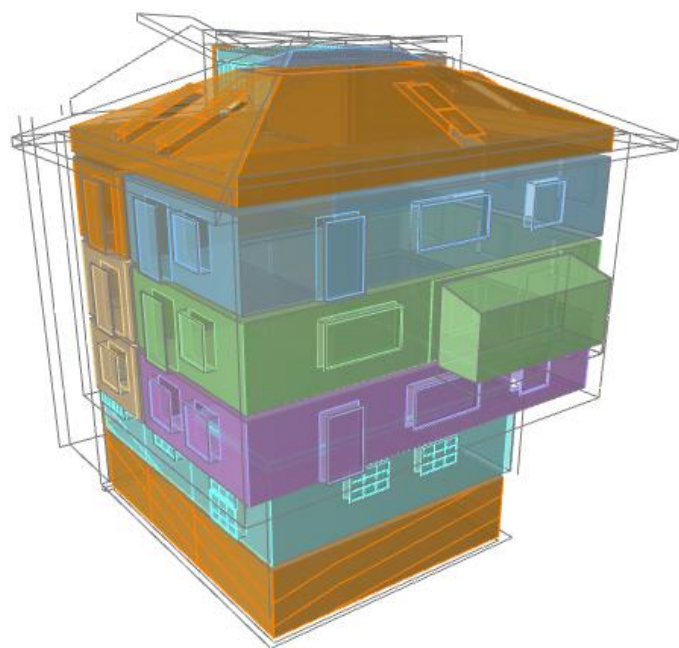
1. BIM



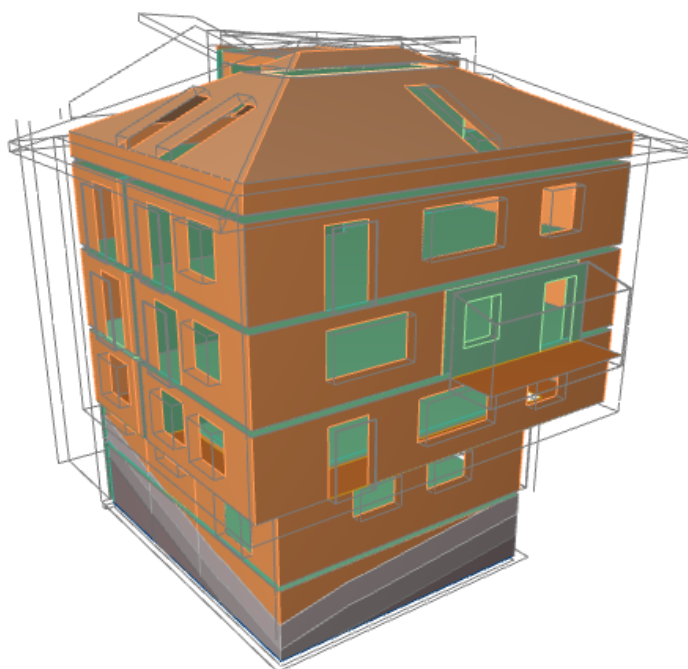
2. zone



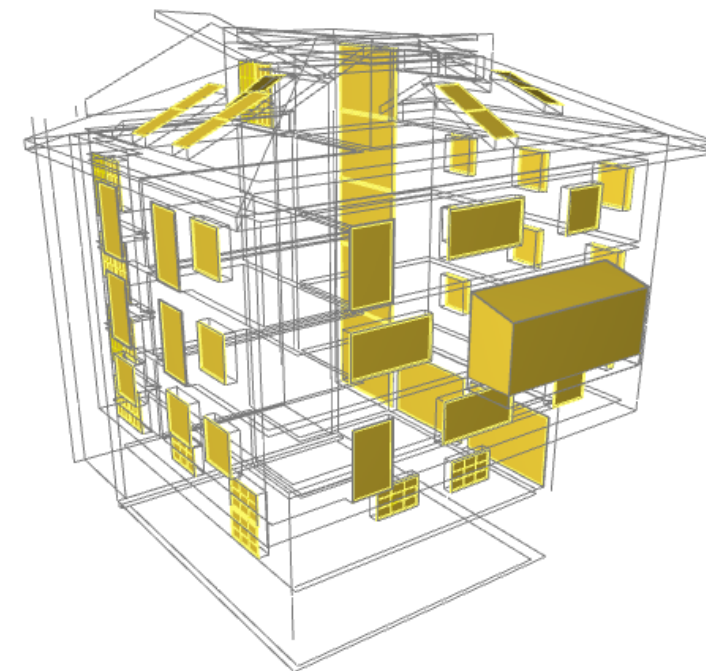
3. BIM + zone



4. termalni blokovi

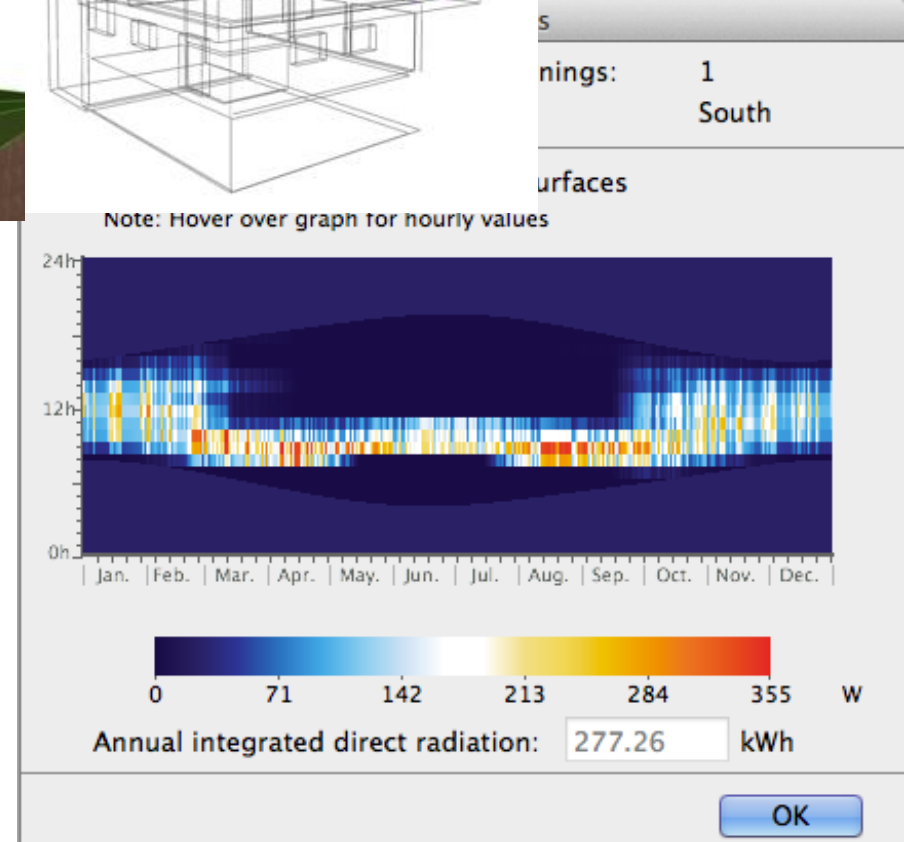
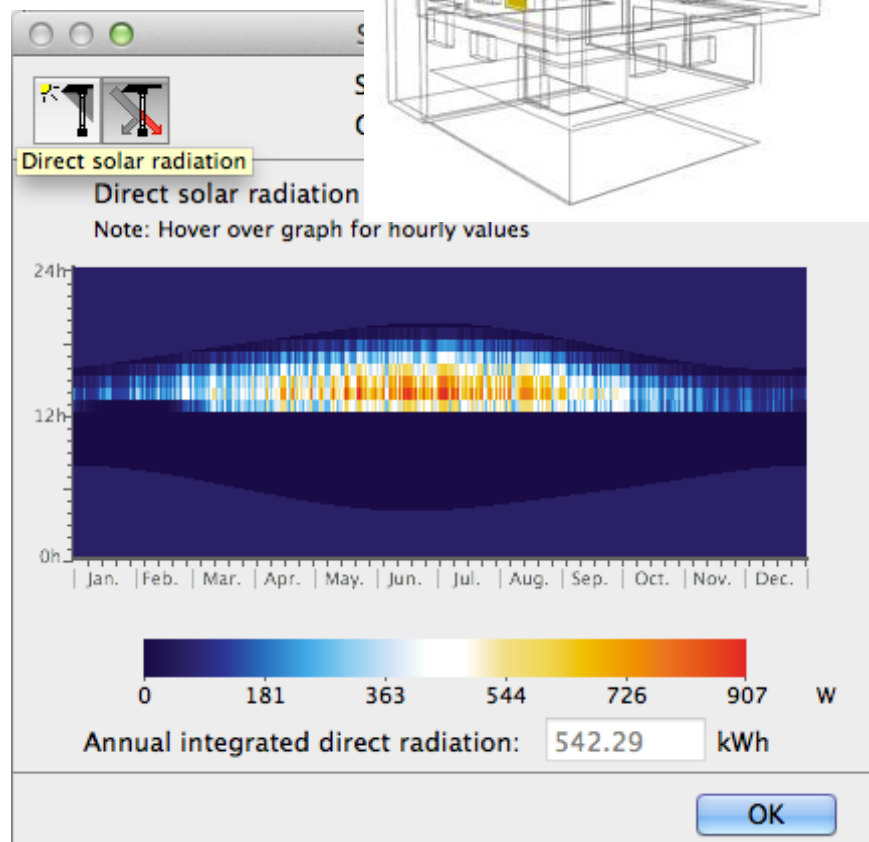
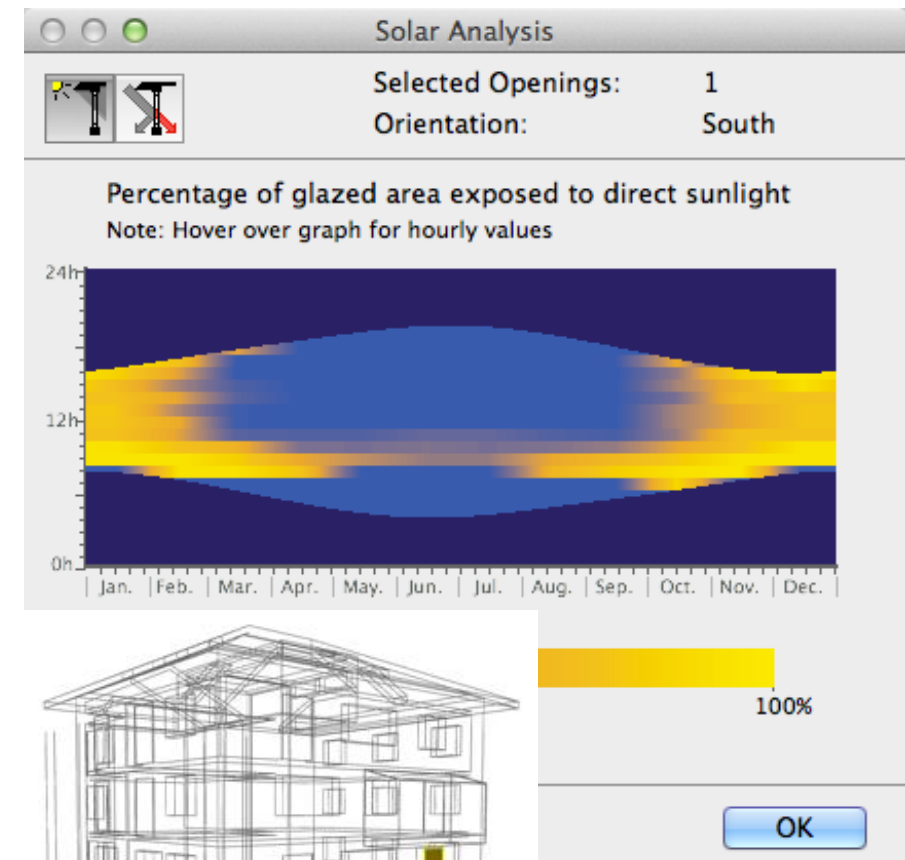
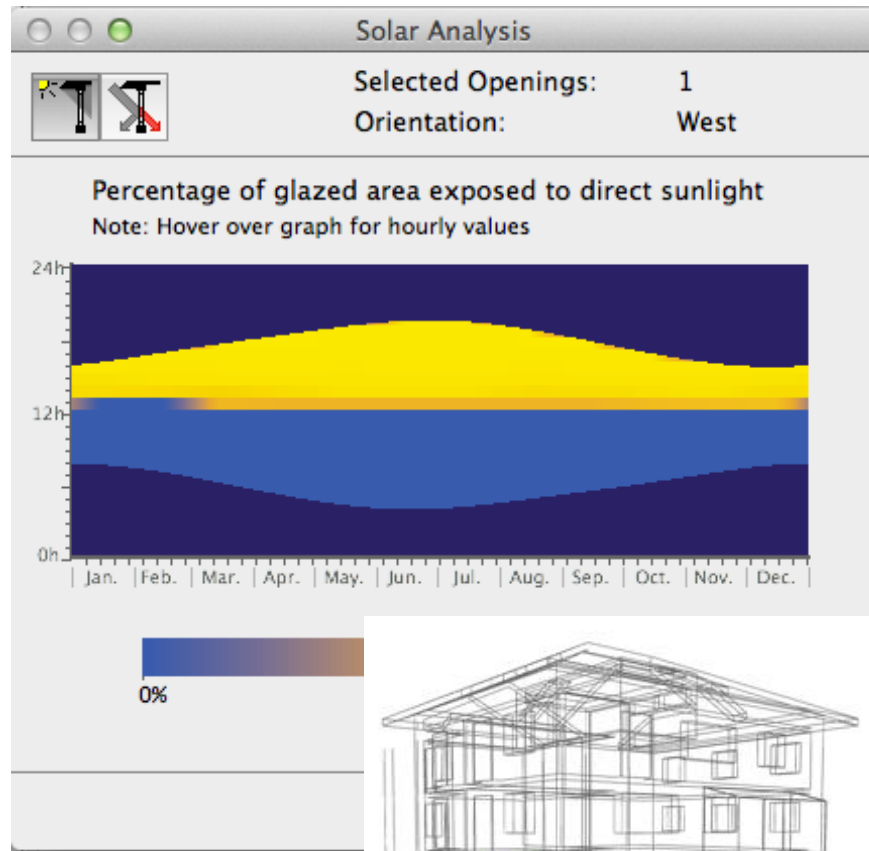


5. konstrukcija

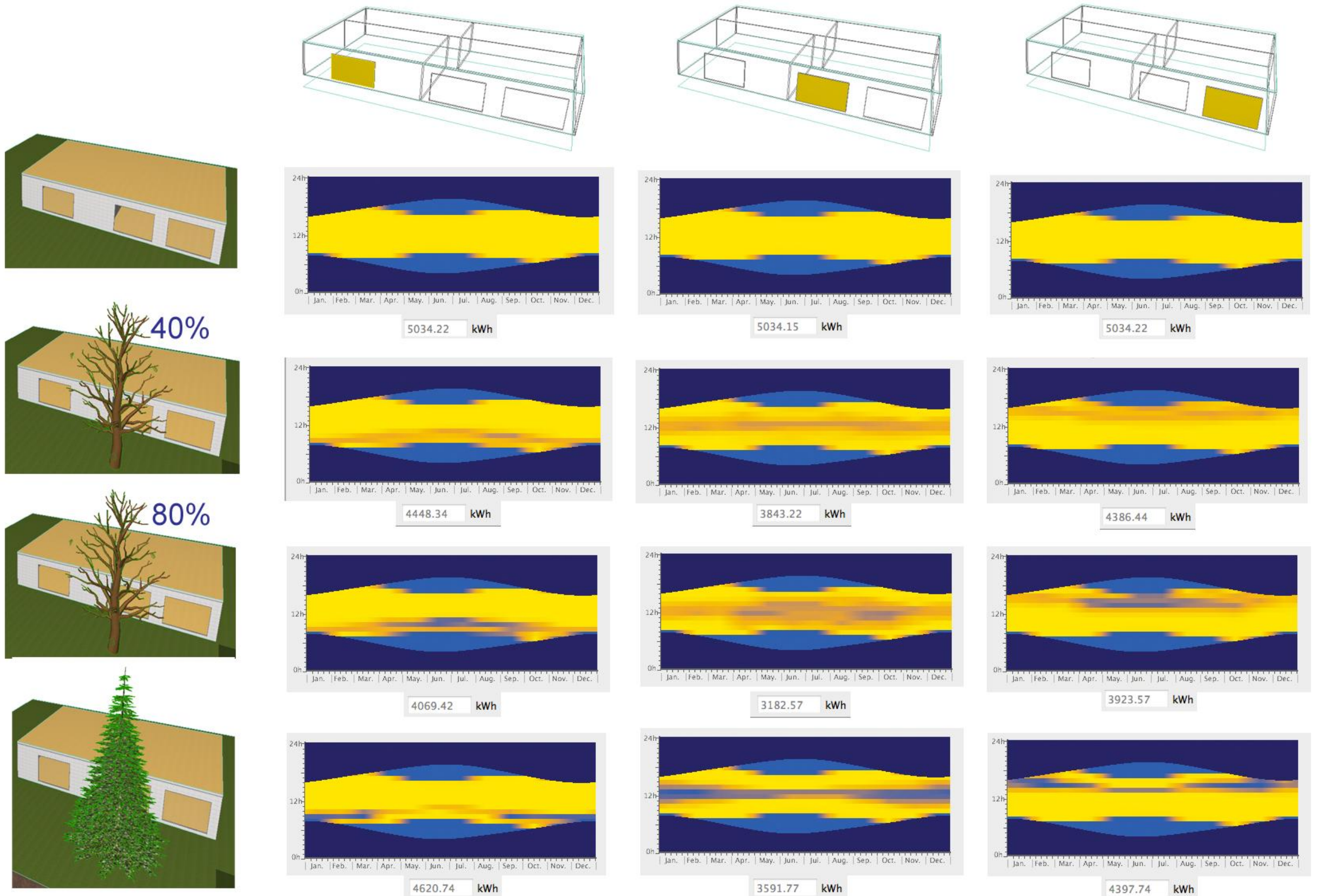


6. otvori

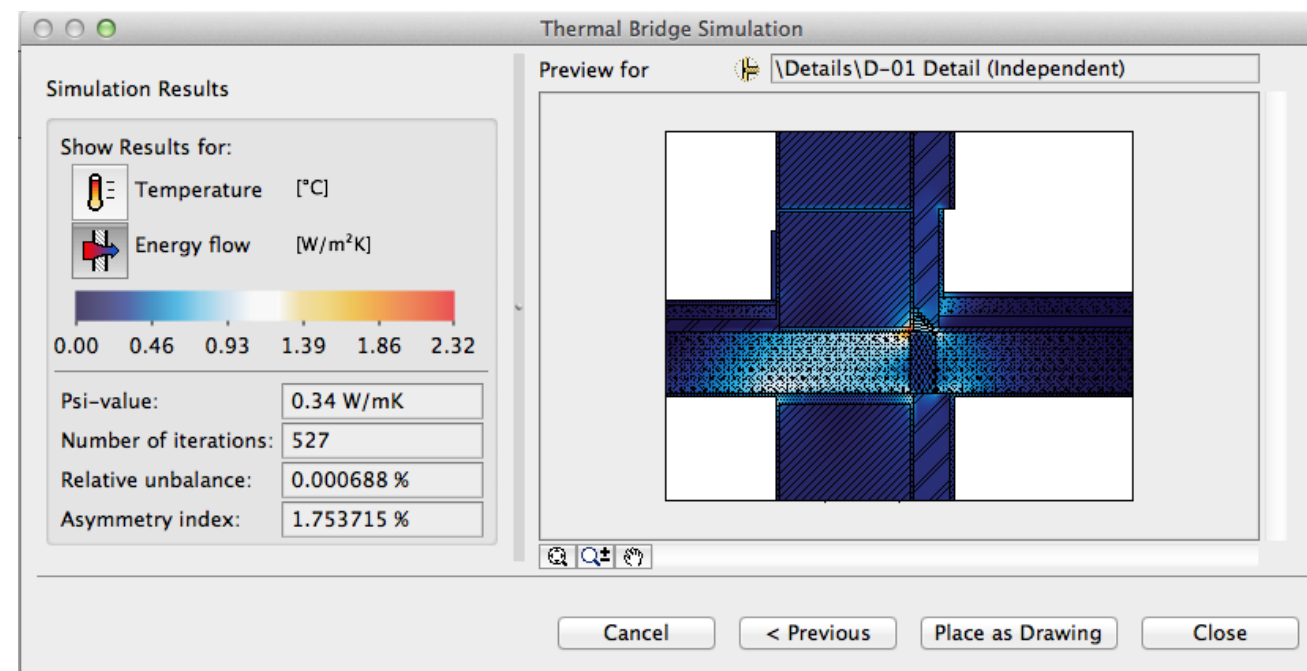
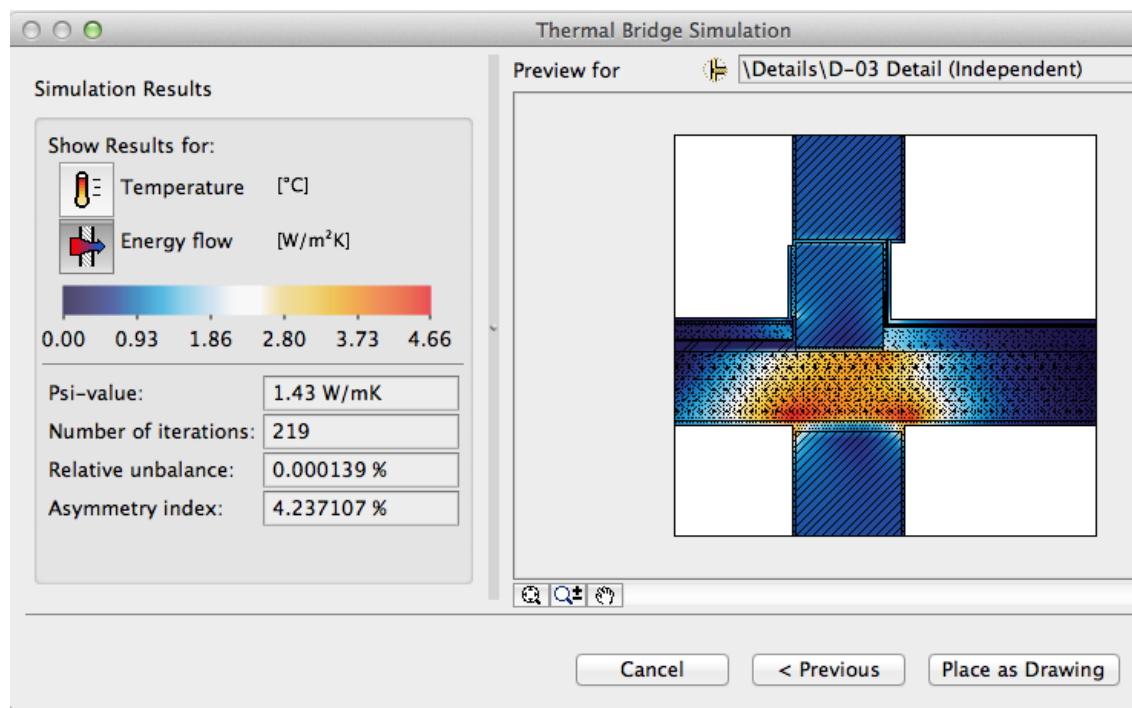
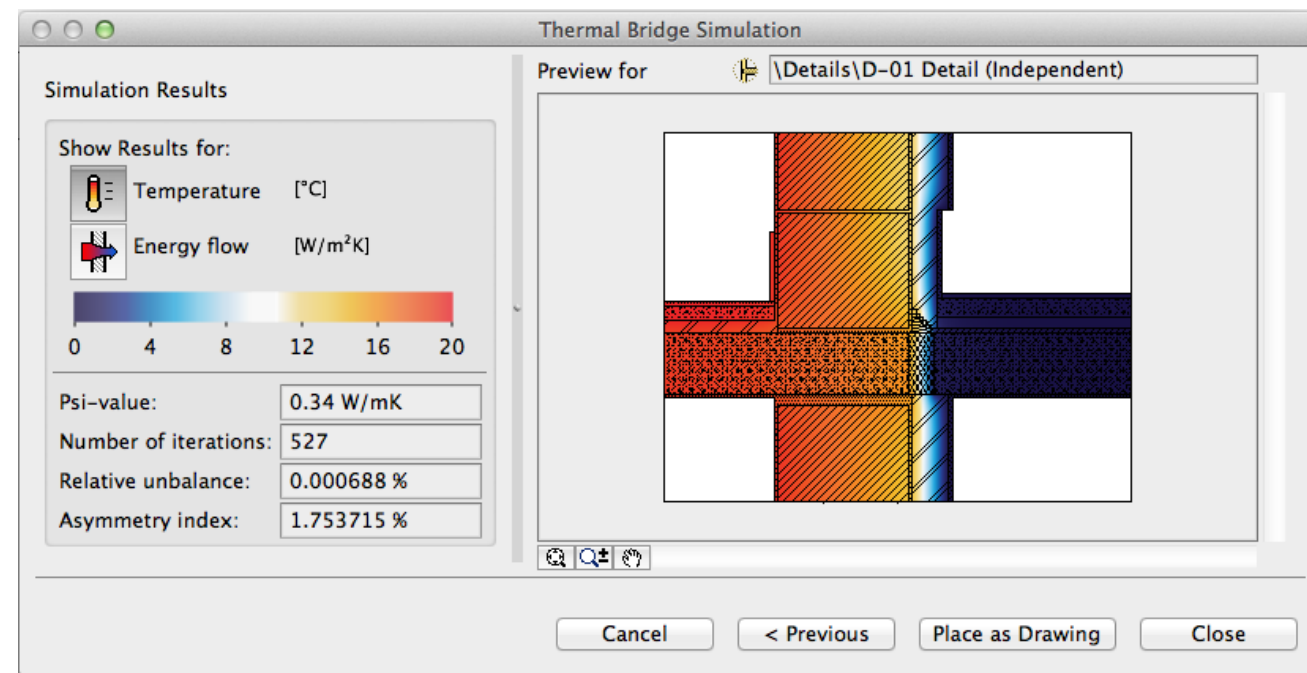
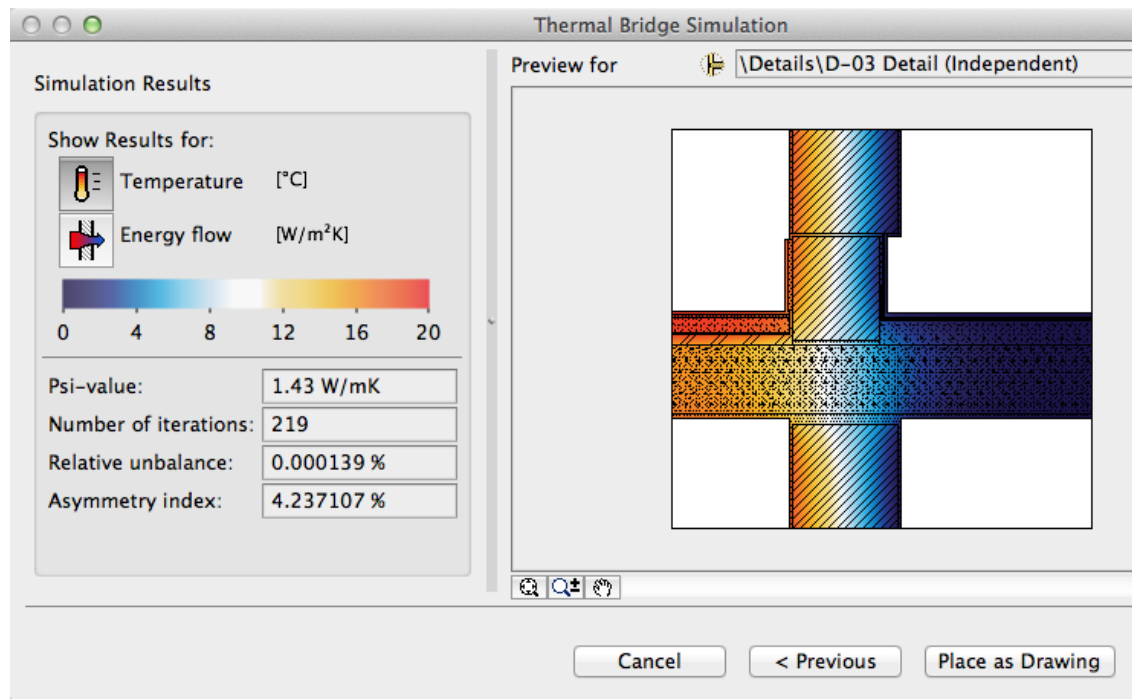
Analiza osunčanja iz modela



Učinak bjelogorične vegetacije



Simulacija hladnih mostova

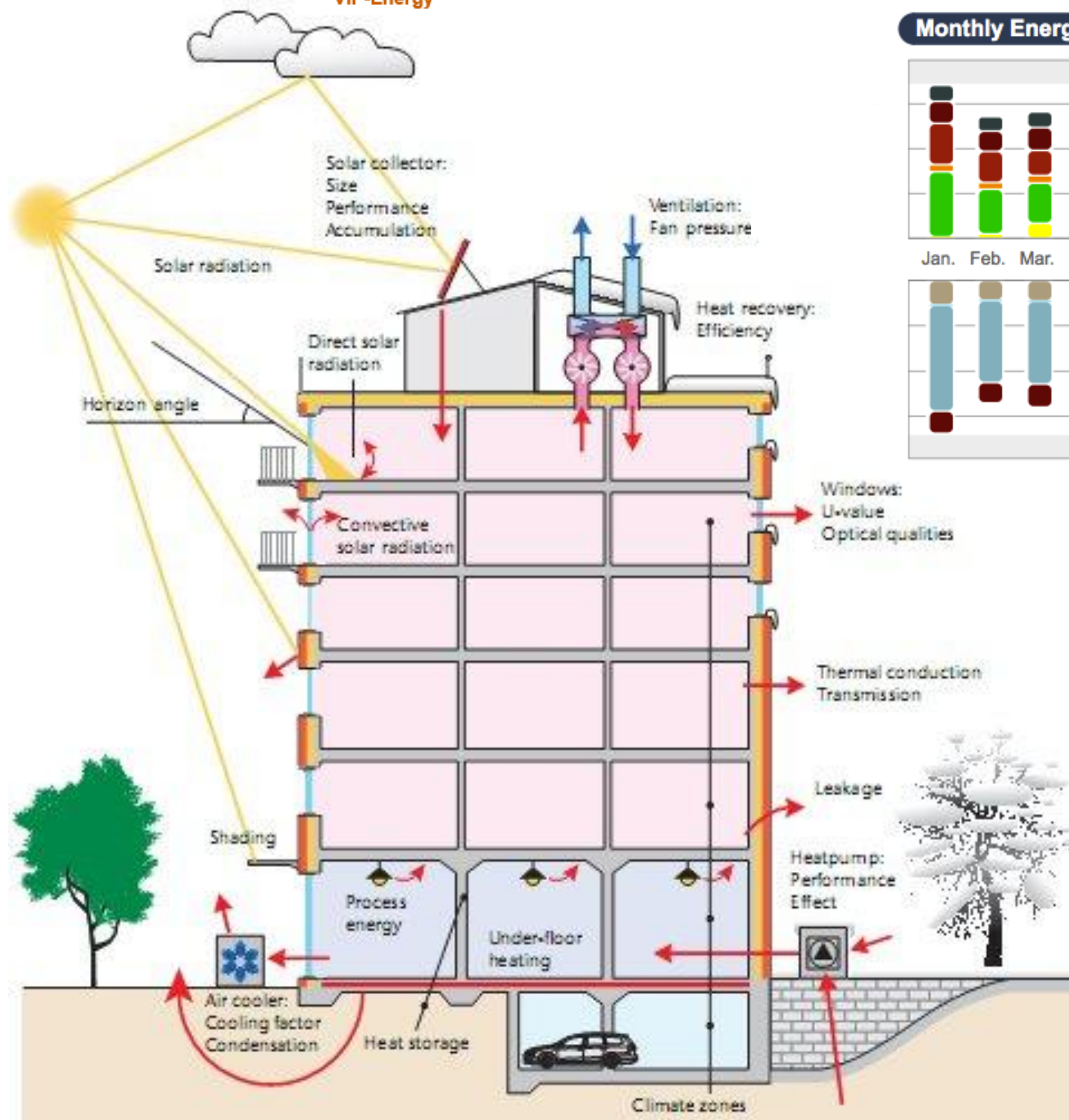


Geometrija zgrade i svojstva materijala – izvoz podataka

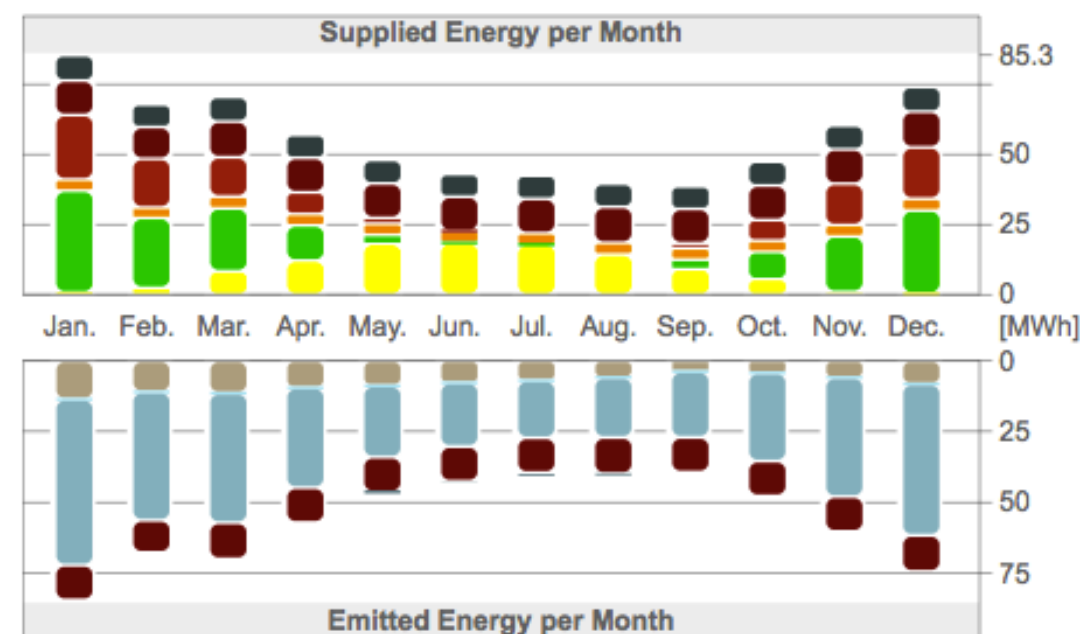


Communication platform	Energy software	Target counties
gbXML	TAS	UK
	AECOsim	INT
	IES VE	UK, USA, AUS
	Design Builder	UK
	Green Building Studio	INT
	Ecotect	INT
	Energy Plus	USA
	eQUEST	USA
	Trane TRACE	USA
	Carrier HAP	USA
IFC	AECOsim	USA
	Hottgenroth Energieberater	GER
	Energy Plus	USA

Dinamička analiza



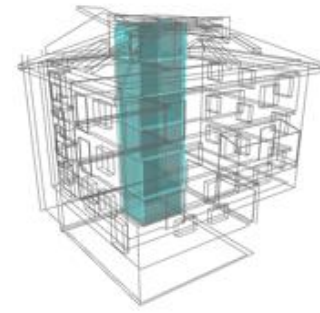
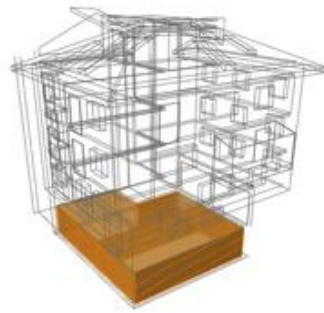
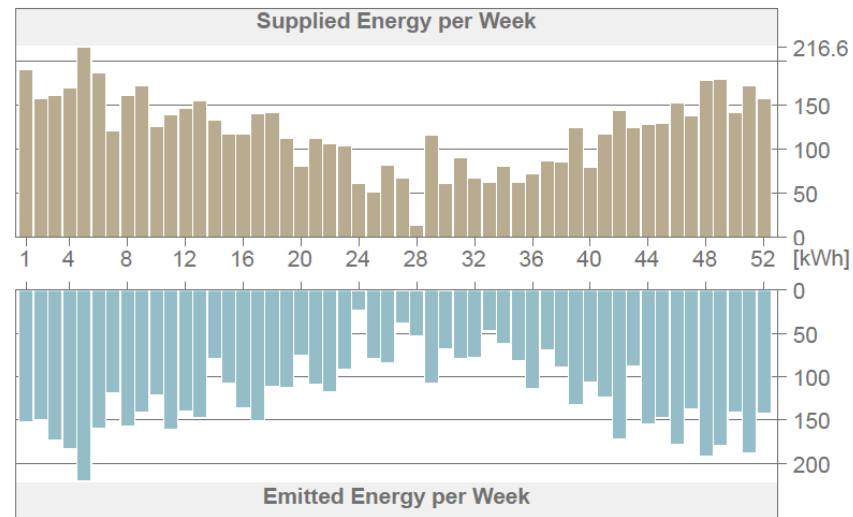
Monthly Energy Balance



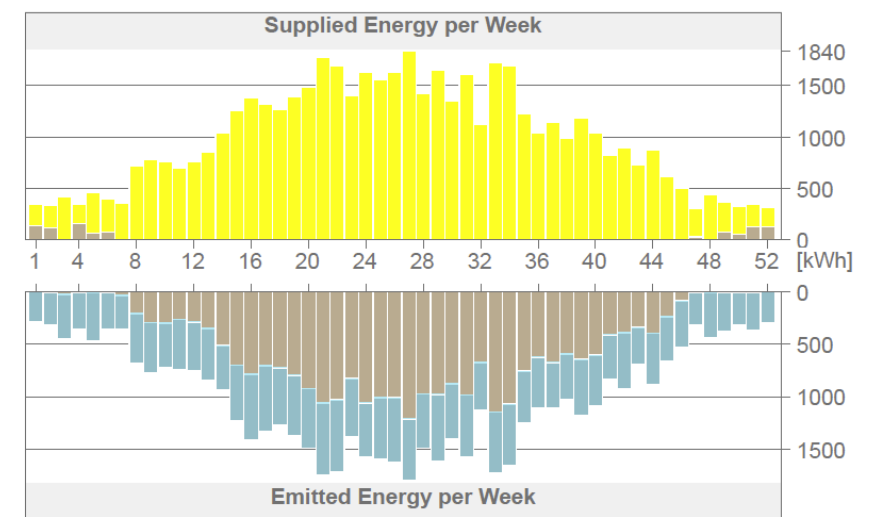
- Lighting and Equipment
- Hot Water Generation
- District Heating
- Internal Heat Gain
- Green Energy
- Solar Gain
- Transmission
- Infiltration
- Mechanical Ventilation
- Hot Water
- Natural Cooling

Energetska bilanca

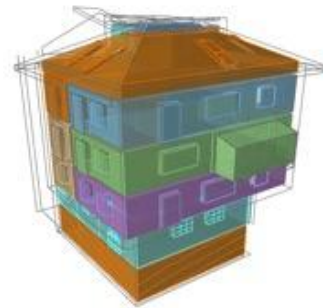
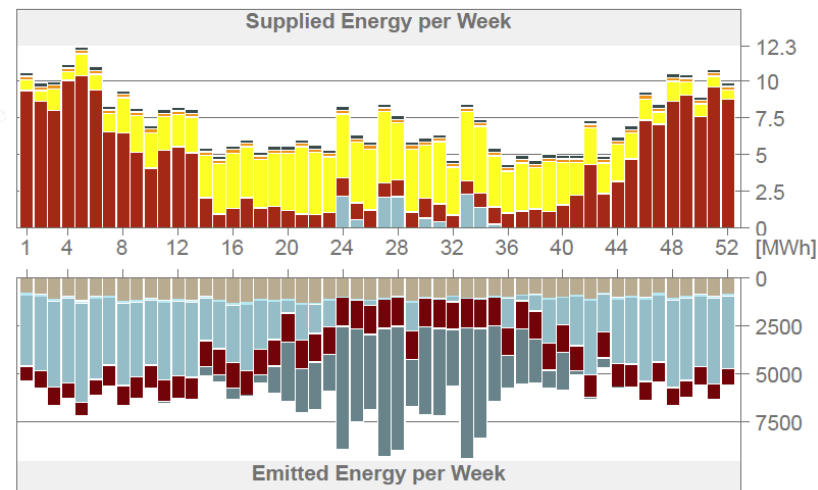
001 Storage basement Energy Balance



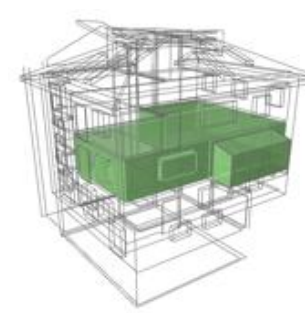
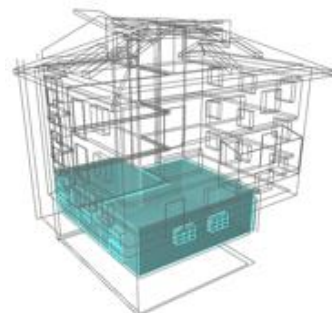
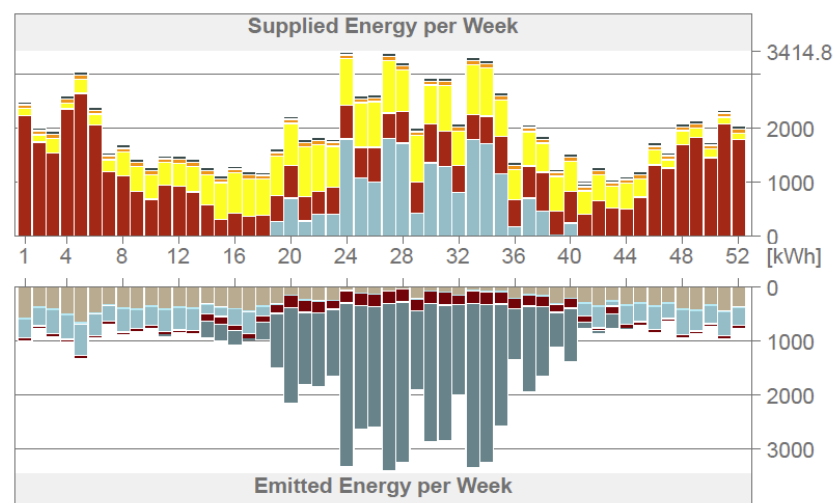
002 Staircase Energy Balance



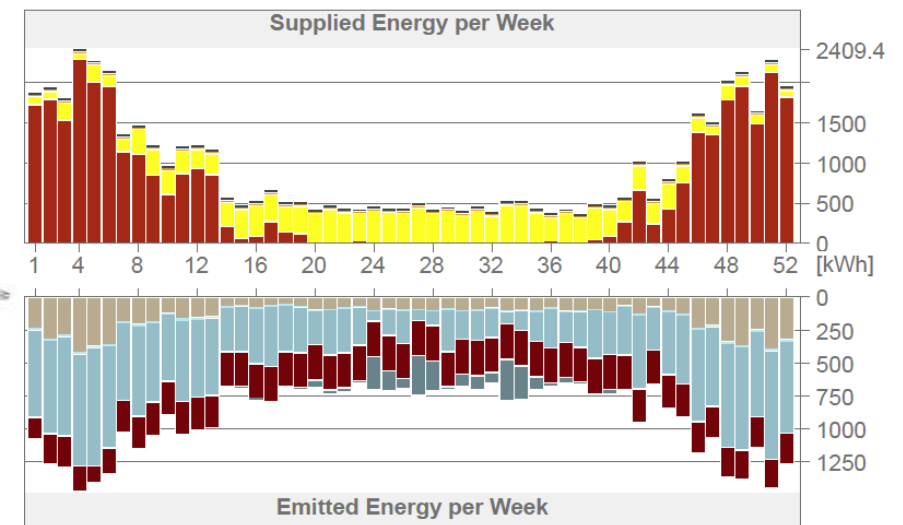
Project Energy Balance



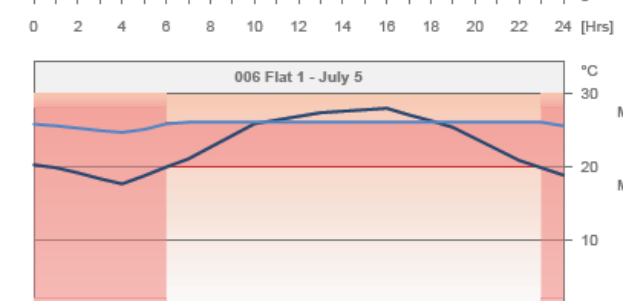
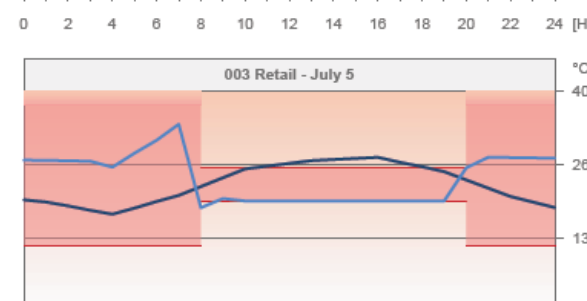
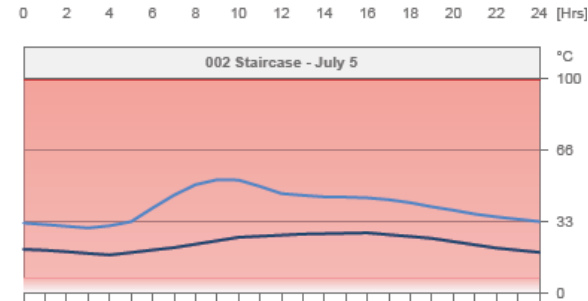
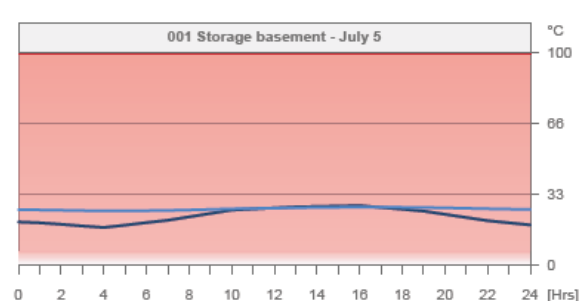
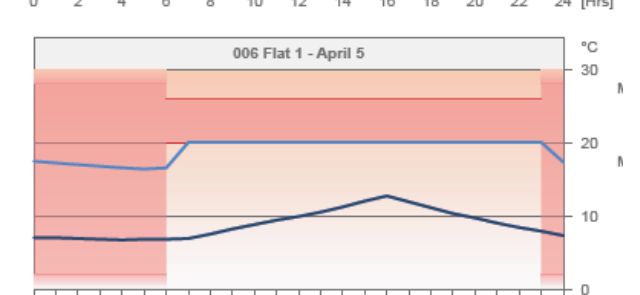
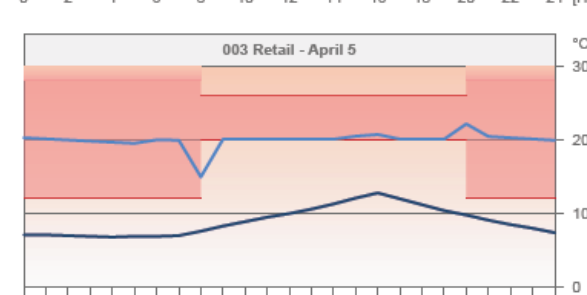
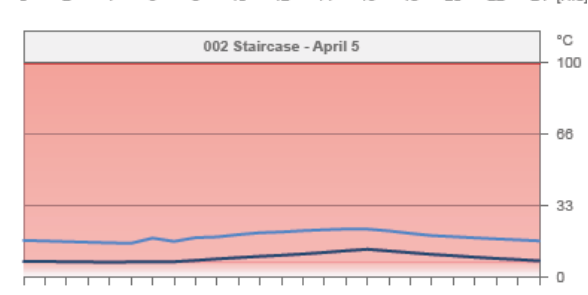
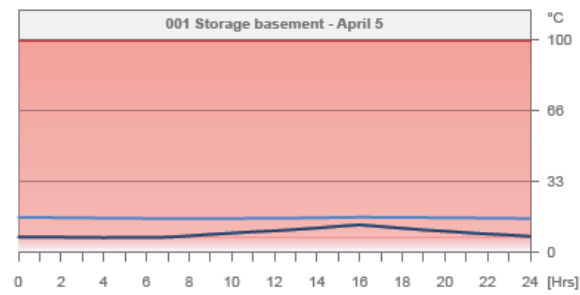
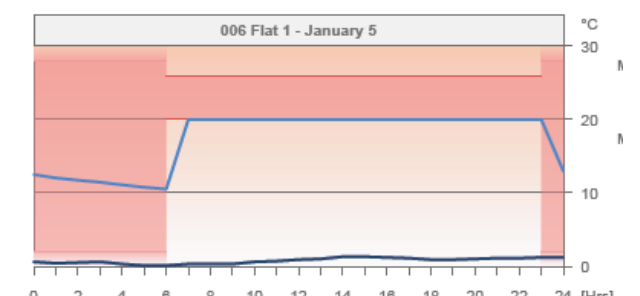
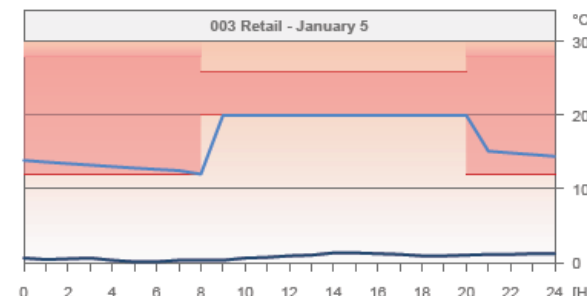
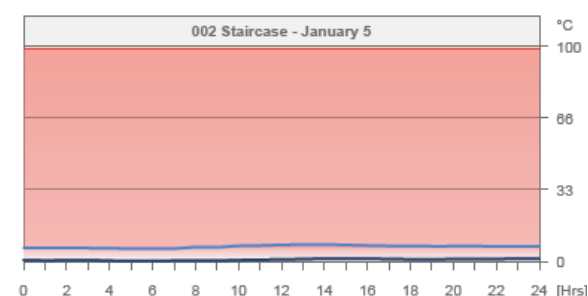
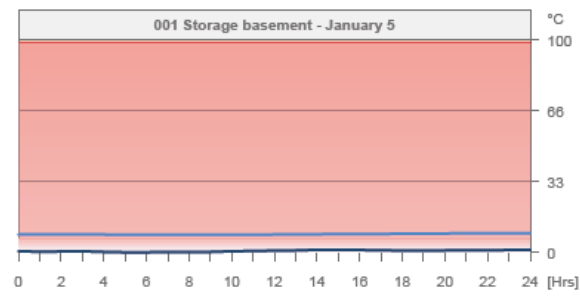
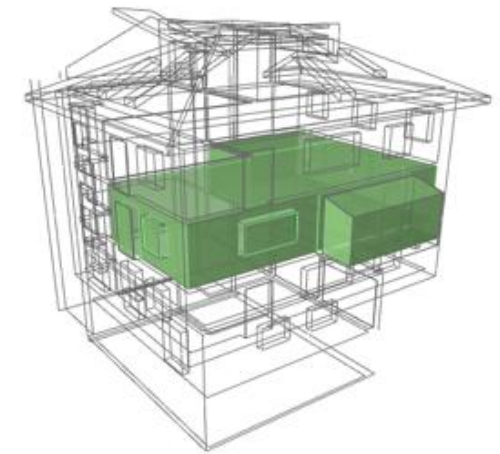
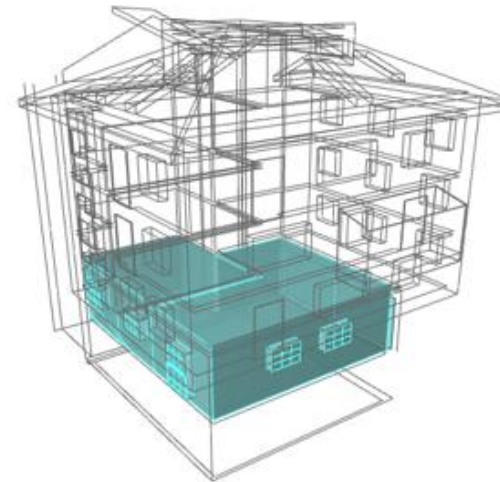
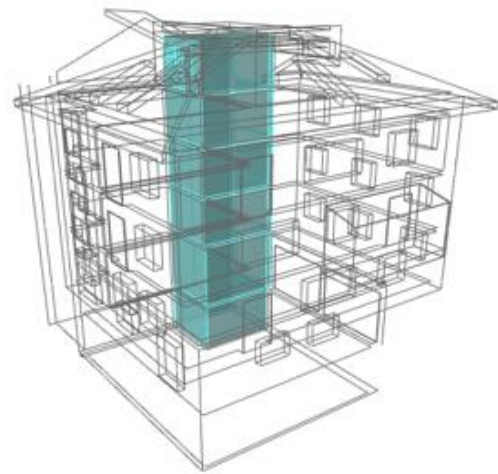
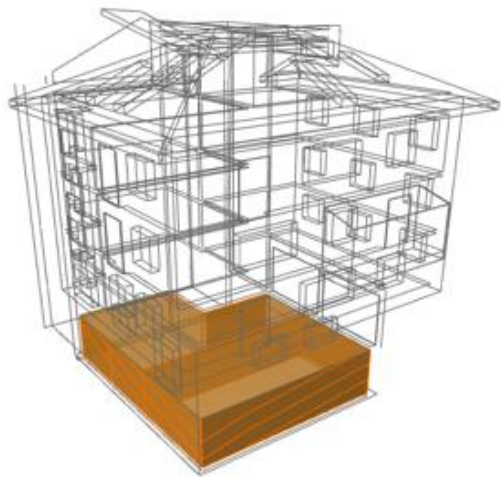
003 Retail Energy Balance



006 Flat 1 Energy Balance



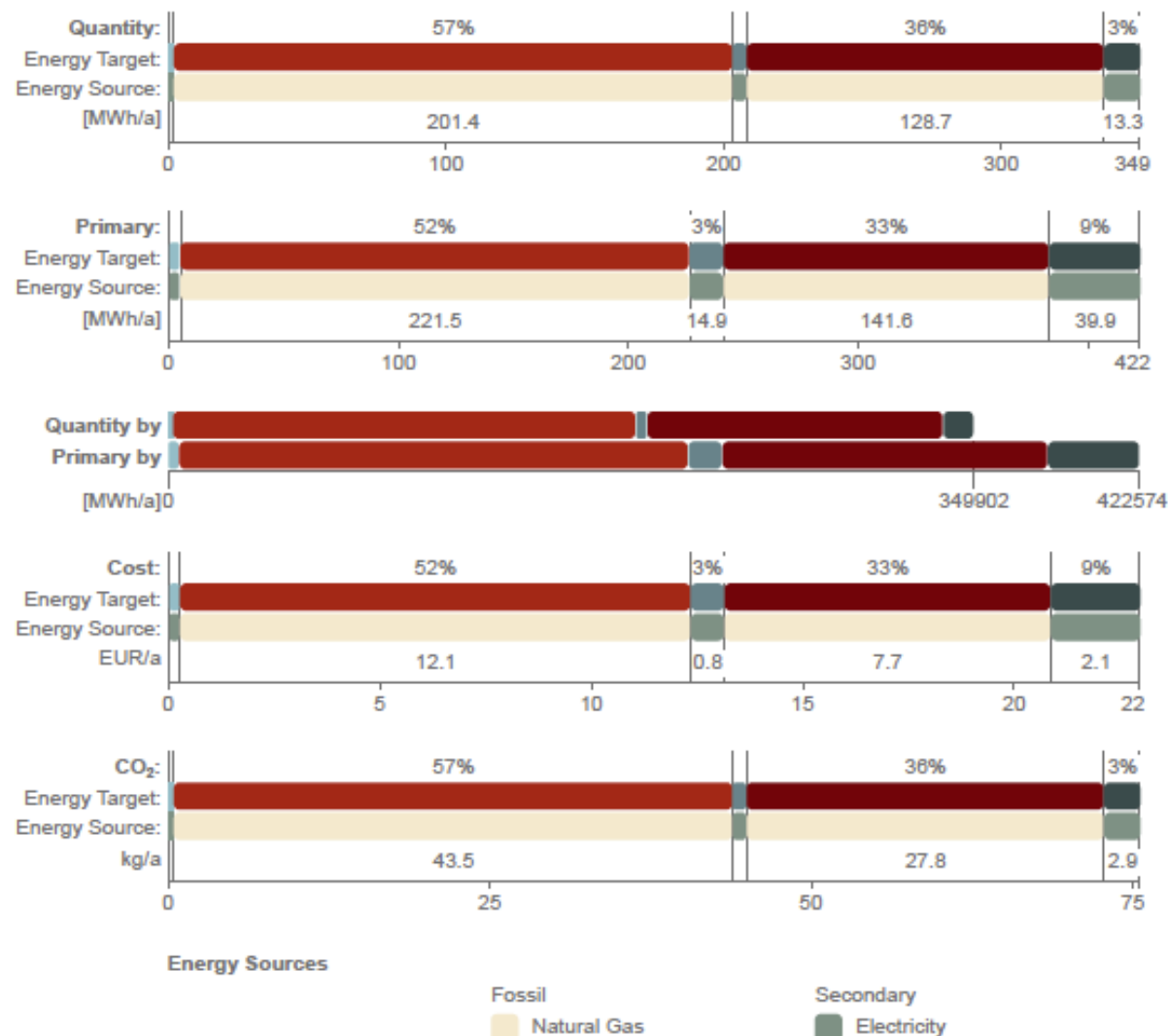
Unutarnja temperatura



Utrošak energenata

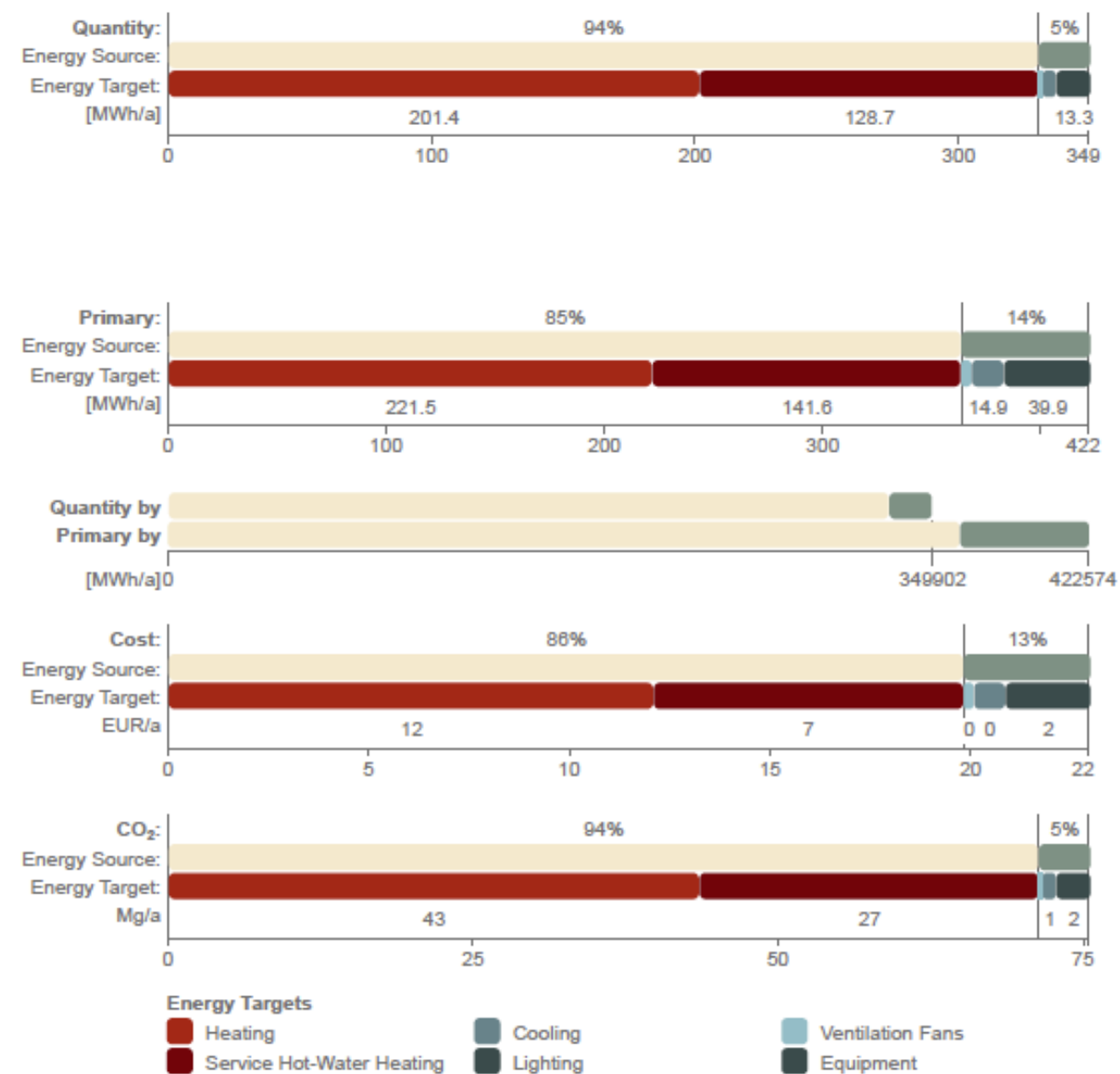
Energy Consumption by Targets

Target Name	Quantity MWh/a	Primary MWh/a	Cost EUR/a	CO ₂ Emission kg/a
Heating	201	221	12081	43492
Cooling	4	14	792	1070
Service Hot-Water	128	141	7722	27802
Ventilation Fans	1	4	251	340
Lighting & Appliances	13	39	2128	2873
Total:	349	422	22977	75578



Energy Consumption by Sources

Source Type	Source Name	Quantity MWh/a	Primary MWh/a	Cost EUR/a	CO ₂ Emission kg/a
Fossil	Natural Gas	330	363	19804	71295
Secondary	Electricity	19	59	3173	4283
Total:		349	422	22977	75578*



Sukladnost svjetskim standardima

Certificirano prema standardima:

- ANSI/ASHRAE Standard 140-2007
- ASHRAE 90.1_2007 Appendix G: Performance Rating Method / USGBC LEED – Energy 2007
- EN-15265 (simulacija prema EN-13790)
- IEA-BESTEST (simulacija prema DOE-2)

Akreditacije u tijeku:

- EN-15265
- IEA-BESTEST Envelope Tests
- Building Energy Simulation Requirements - Švedska
- Green Star Energy – JAR
- Green Mark – Singapore
- LEED - United Arapski Emirati
- Qualification for the calculation of the energy and power cost savings for commercial building tax deductions under tax code Section 179D
- BCA Section J - Australija
- NatHERS - Australija
- NABERS / Green Star Energy AUS – Australija





Graphisoft ArchiCAD probna verzija besplatno je dostupna na:

www.myarchicad.com



EcoDesigner Star public beta besplatno je dostupna na:

edstarbeta.graphisoft.com

Hvala! :-)



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+385 98 313 698

