

# Simulació energètica per a certificació LEED





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Des de Co2en Enginyeria ens hem especialitzat en la obtenció dels següents crèdits:

*Referent a LEED 2009 NC*

-EAc1: Minimum Energy Performance

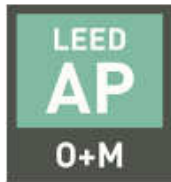
-EAp2: Optimize Energy Performance

Mitjançant la Opció 1, simulació detallada del model segons normativa ASHARE 90.1-2007 (es poden obtenir fins a 19 crèdits)

-IEQc8.1: Daylight and Views-Daylight



Estudi de la il·luminació natural



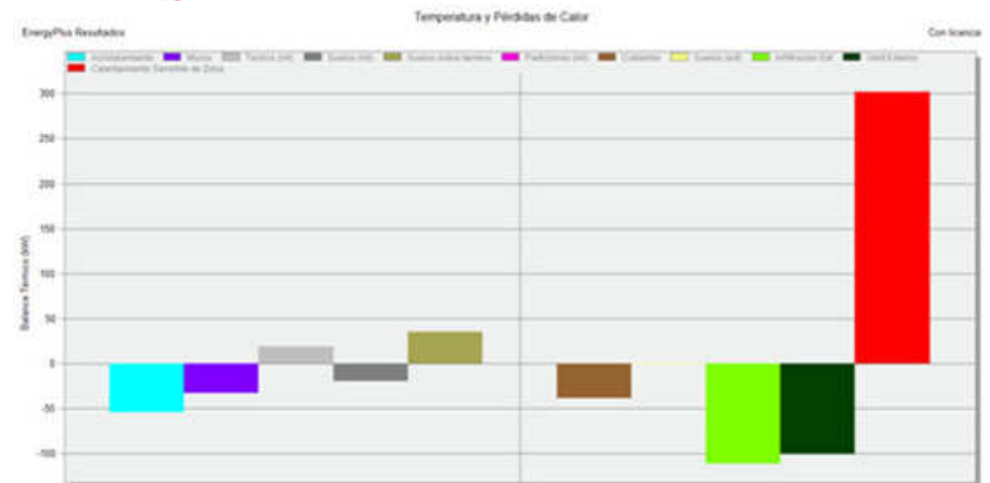
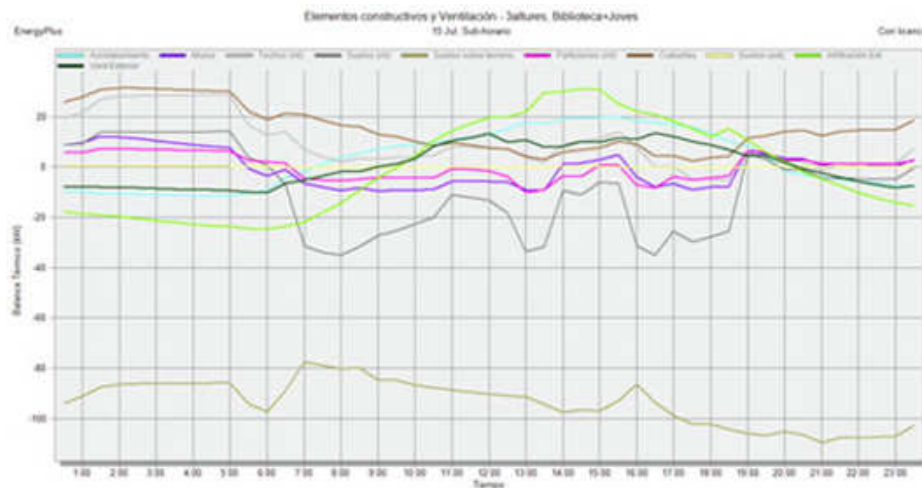
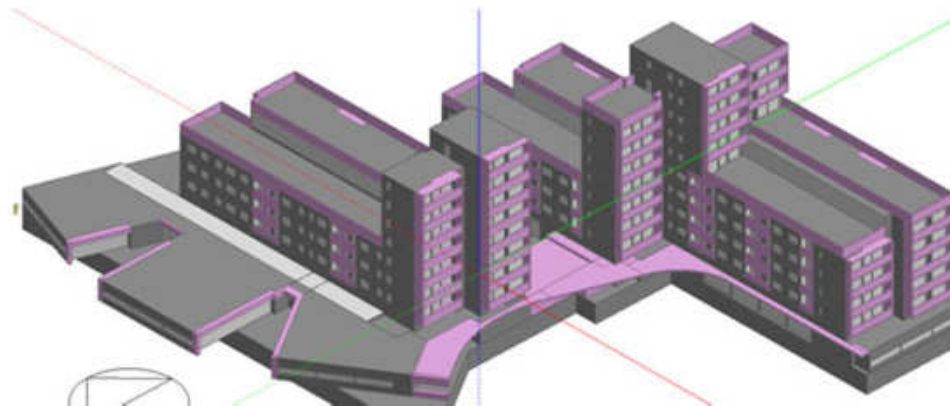
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# SOFTWARE UTILITZAT



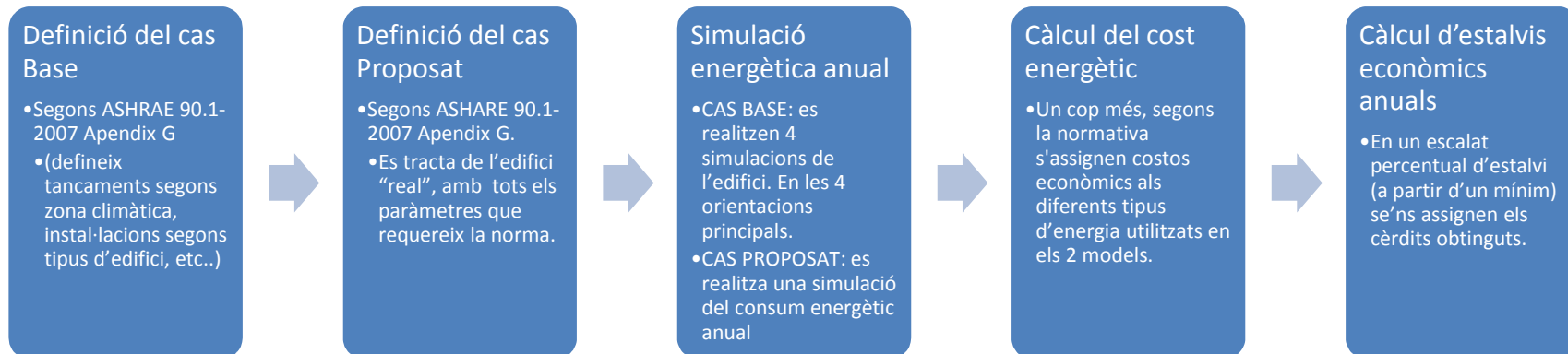
Per tal d'acomplir amb els requeriments de la norma ASHARE 90.1-2007, és necessària la utilització de softwares de càlcul avançats. Co2en compta amb contrastada experiència en la utilització dels softwares Design Builder i Energy Plus.

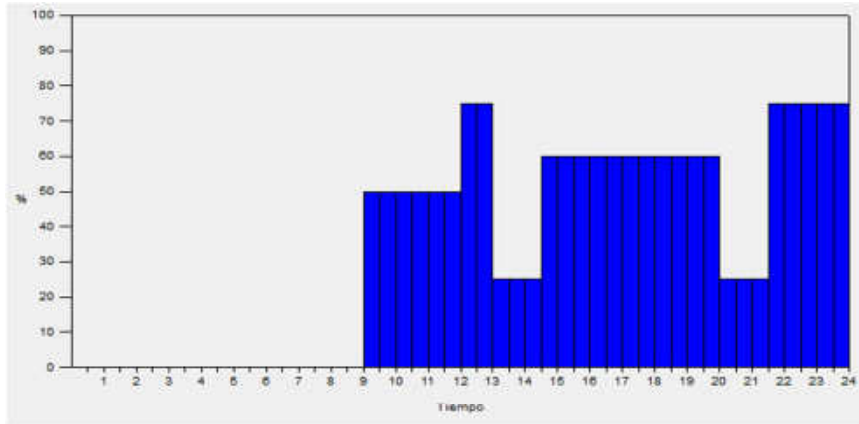




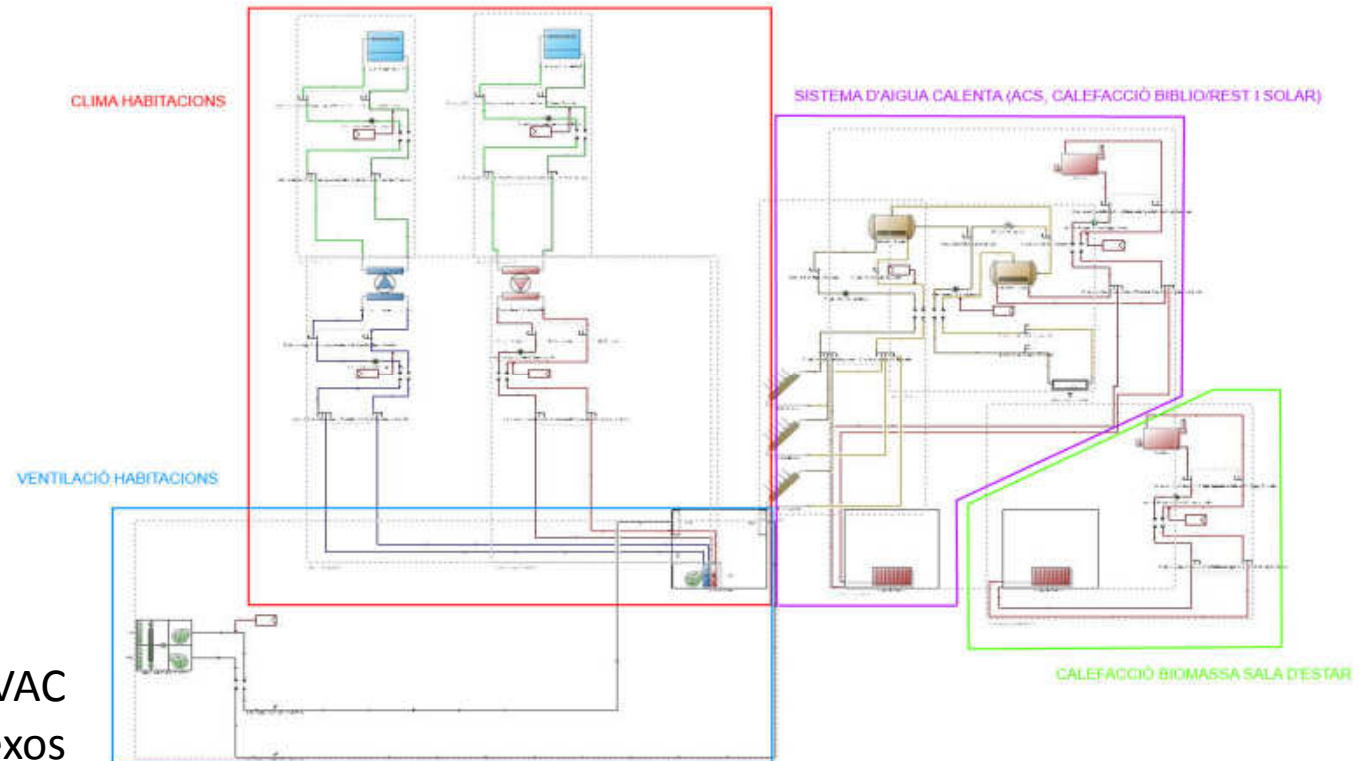
## ENERGY AND ATMOSPHERE (Crèdits EA)

Per tal de certificar l'acompliment dels crèdits d'energia i atmosfera segons la opció 1, s'ha seguit un procediment establert segons la normativa ASHRAE 90.1. Seguidament s'explica de forma sintetitzada el procediment:



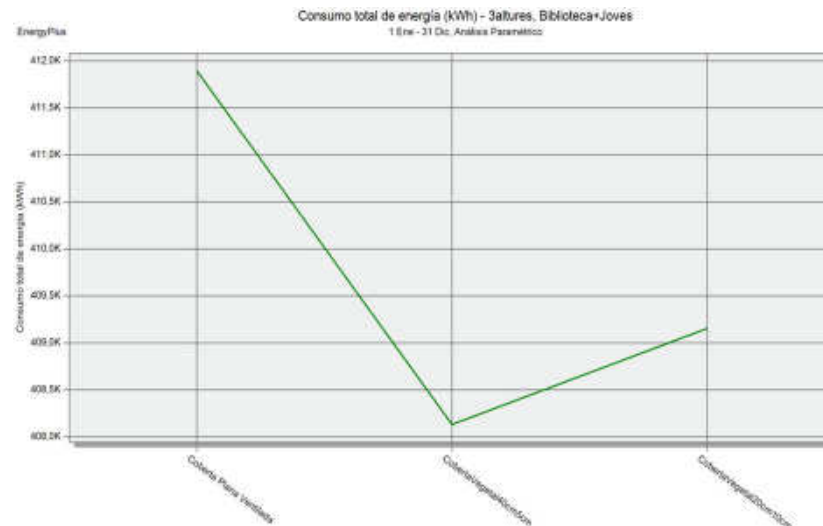
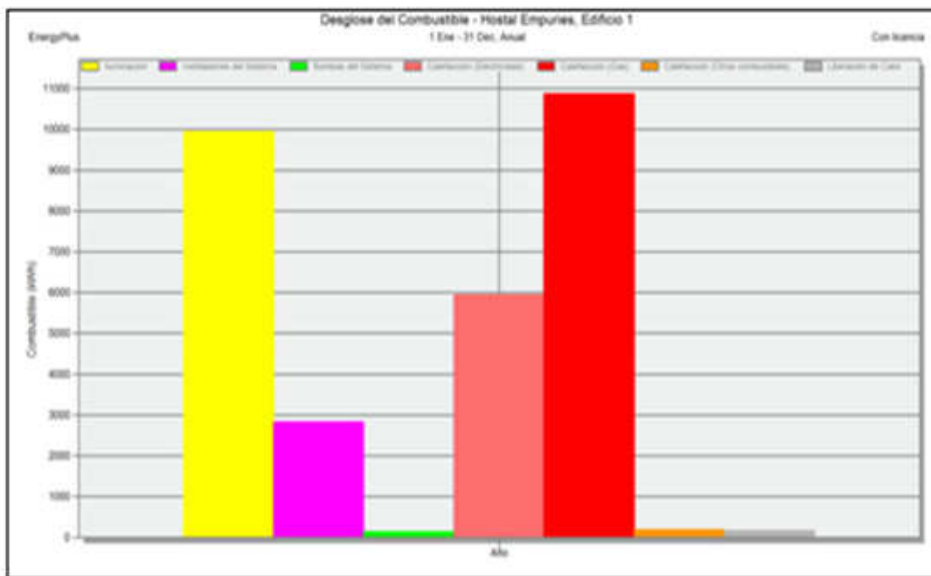


### Definició de programacions de funcionament 7/24

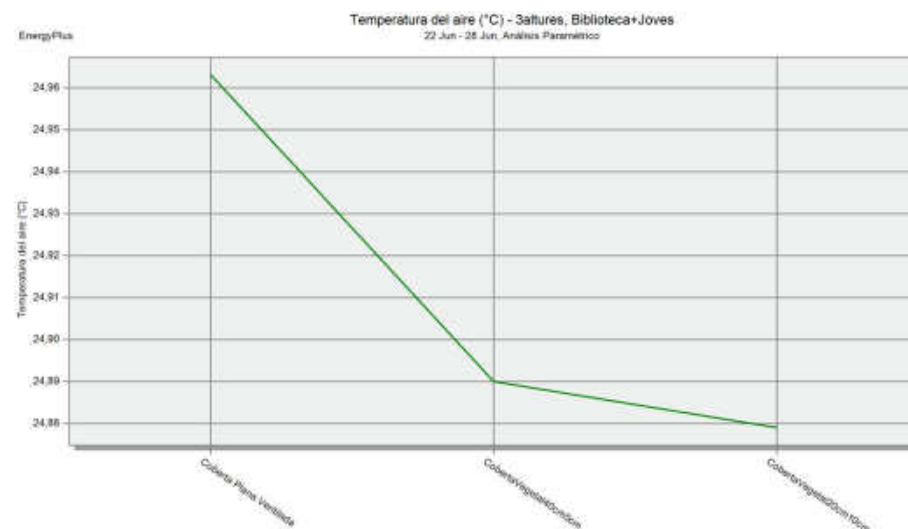


Definició de sistemes HVAC complexos

Simulació del consum energètic (cas proposat)



Estudi i proposta de Millors

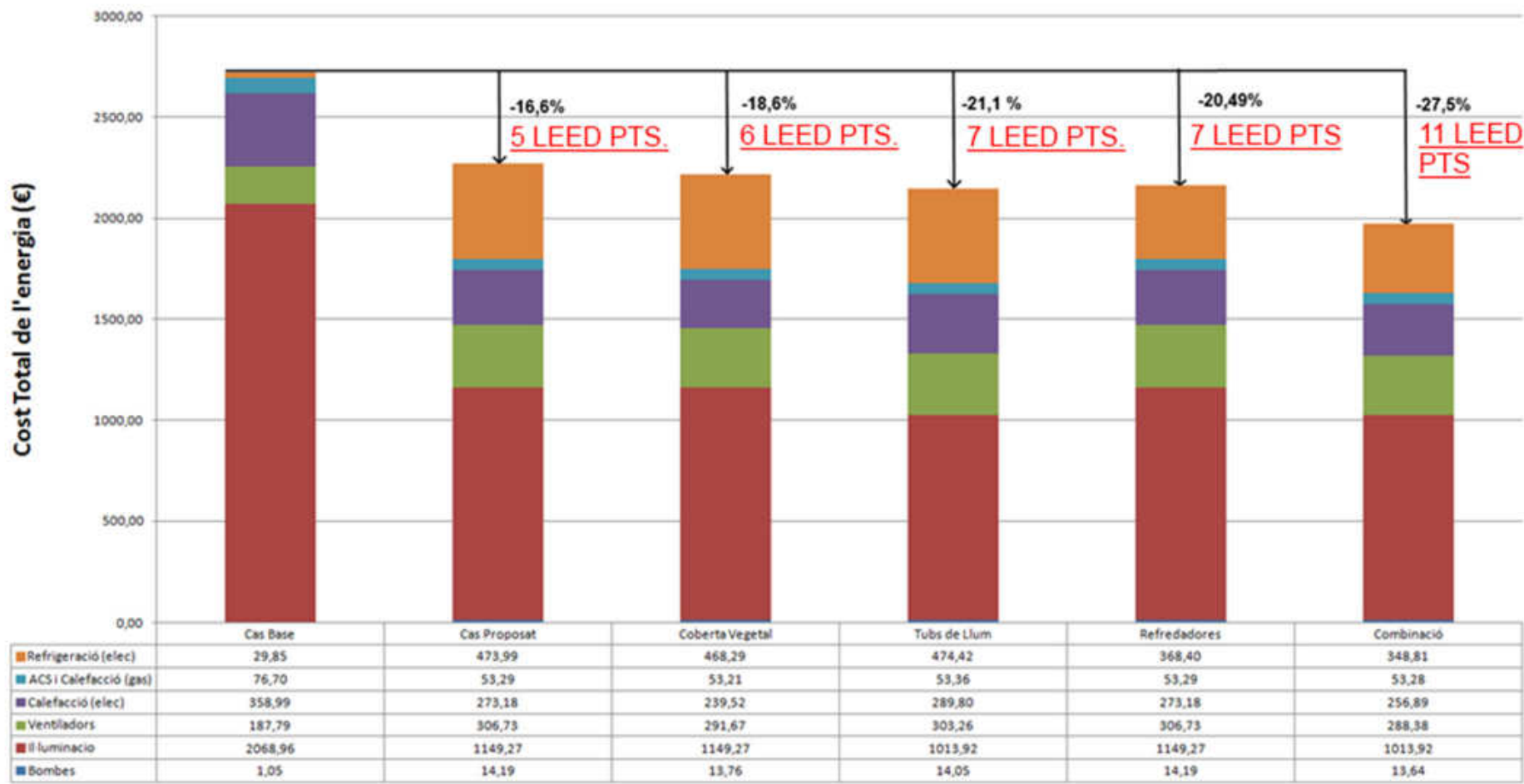




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## ESTALVI ECONÒMIC ANUAL





# Simulació energètica per a certificació LEED



## Formularis LeedOnline



### LEED 2009 for New Construction and Major Renovations EA PREREQUISITE 2: MINIMUM ENERGY PERFORMANCE

All fields and uploads are required unless otherwise noted.

#### THRESHOLD ATTEMPTED

Points Attempted: 0

#### ALL PROJECTS

##### TARGET FINDER

The following fields are required, but the values have no bearing on EA Prerequisite 2 compliance. Use the Target Energy Performance Results calculator on the [ENERGY STAR website](#) to generate the values. If using prescriptive compliance paths (Options 2 or 3), leave the Design energy consumption and cost values blank in the Target Finder website, and set the Design values equal to the Target values in this form.

Energy performance rating (1-100):	<input type="text" value="0"/>	Design	<input type="text" value="0"/>	Target
CO <sub>2</sub> -eq emissions:	<input type="text" value="0"/>	multi-ton/year	<input type="text" value="0"/>	multi-ton/year
CO <sub>2</sub> -eq emissions reduction:	<input type="text" value="0"/>	%	<input type="text" value="0"/>	%

Upload EA2-16. Provide the Target Finder Energy Performance Results (a screen capture or other documentation containing the same information) for the project building. (Optional)

The building is not able to get a Target Finder score because the tool does not support the primary building type of the project building and/or the project is not located in the United States. (Optional)

##### PREREQUISITE COMPLIANCE

Total gross square footage:

The values highlighted in yellow above is linked to FRC 903, 902, 901, 801, 802, 803, 801.1 & 801.2

Principal project building activity:

The content highlighted in yellow above is linked to FRC 8.04.1

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EA Prerequisite 2: Minimum Energy Performance

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Save Form

Page 1 of 10

#### SECTION 1.6 - PERFORMANCE RATING METHOD COMPLIANCE REPORT

##### Table EA2-18. End Use Energy Percentage

In the table below, the end use energy use data for the alternate modeling of one case reflected in the baseline and proposed modeling. Then check whether the modeling is a prescriptive path, when the energy use and the energy consumption end use data demand for each end use for all building design scenarios.

End Use	Baseline Energy Use (kWh)	Proposed Energy Use (kWh)	Baseline Energy Demand (kWh)	Proposed Energy Demand (kWh)	Baseline Energy Savings (%)	Proposed Energy Savings (%)
Interior Lighting	48.32	30.26	189.03	149.77	19.93	26.25
Space Heating	9.32	8.71	14.08	13.39	4.06	3.83
Space Cooling	0.56	9.4	-57.49	-57.93	-16.75	-16.75
Fans - Interior	4.47	7.75	-21.12	-21.12	-4.65	-4.65
Service Water Heating	37.16	42.97	-7.95	-7.95	-21.12	-21.12
Receptacle Equipment	0	0	0	0	0	0
Miscellaneous	0.05	0.9	-6.55	-6.55	-16.75	-16.75

#### Table EA2-18. End Use Energy Percentage

	Baseline Case (%)	Proposed Case (%)	End Use Energy Savings (%)
Interior Lighting	48.32	30.26	189.03
Space Heating	9.32	8.71	14.08
Space Cooling	0.56	9.4	-57.49
Fans - Interior	4.47	7.75	-21.12
Service Water Heating	37.16	42.97	-7.95
Receptacle Equipment	0	0	0
Miscellaneous	0.05	0.9	-6.55

Select one of the following:

- The project used DOE2, eQuest or Visual DOE.
- The project used EnergyPlus.
- The project team used EnergyPro.
- The project team used HAP.
- The project team used Trace.
- The project team used other modeling software.

Upload EA2-16. Provide supporting documents such as input and output summaries, energy and cost reports, etc.

Upload File: 1

#### ADDITIONAL DETAILS

- Special circumstances preclude documentation of prerequisite compliance with the submittal requirements outlined in this form.
- The project team is using an alternative compliance approach in lieu of standard submittal paths.

#### SUMMARY

EA Prerequisite 2: Minimum Energy Performance Compliance Documented

Check Compliance

#### SECTION 1.6A - TOTAL BUILDING PERFORMANCE SUMMARY

##### Table EA2-19. Total Building Energy Use Performance

Energy Type	Units	Baseline	Proposed	Baseline 1.0 Total Energy Use	Baseline 1.0 Energy Demand	Baseline 1.0 Renewable Energy Demand	Total Energy Use
Electricity	kWh	0	0	0	0	0	0
Natural Gas	MMBtu	0	0	0	0	0	0
Water	MMBtu	0	0	0	0	0	0
Energy use savings (%)							

Table EA2-19. Total Building Energy Use Performance  
The values below are automatically calculated using the total energy use from Section 1.6 unless the project team has used a manually input value in Section 1.6.1, 1.6.2, or 1.6.3. To verify these values prior to submittal calculation, visit the website on Section 1.6.1, 1.6.2, or 1.6.3.

Energy Type	Units	Baseline	Proposed	Baseline 1.0 Total Energy Use	Baseline 1.0 Energy Demand	Baseline 1.0 Renewable Energy Demand	Total Energy Use
Electricity	kWh	0	0	0	0	0	0
Natural Gas	MMBtu	0	0	0	0	0	0
Water	MMBtu	0	0	0	0	0	0
Energy use savings (%)							

Baseline project energy use (as a percent of total energy use (%))

0

EA Credit 1: Green Source  
The credit is applied to the end use energy use.

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EA Prerequisite 2: Minimum Energy Performance

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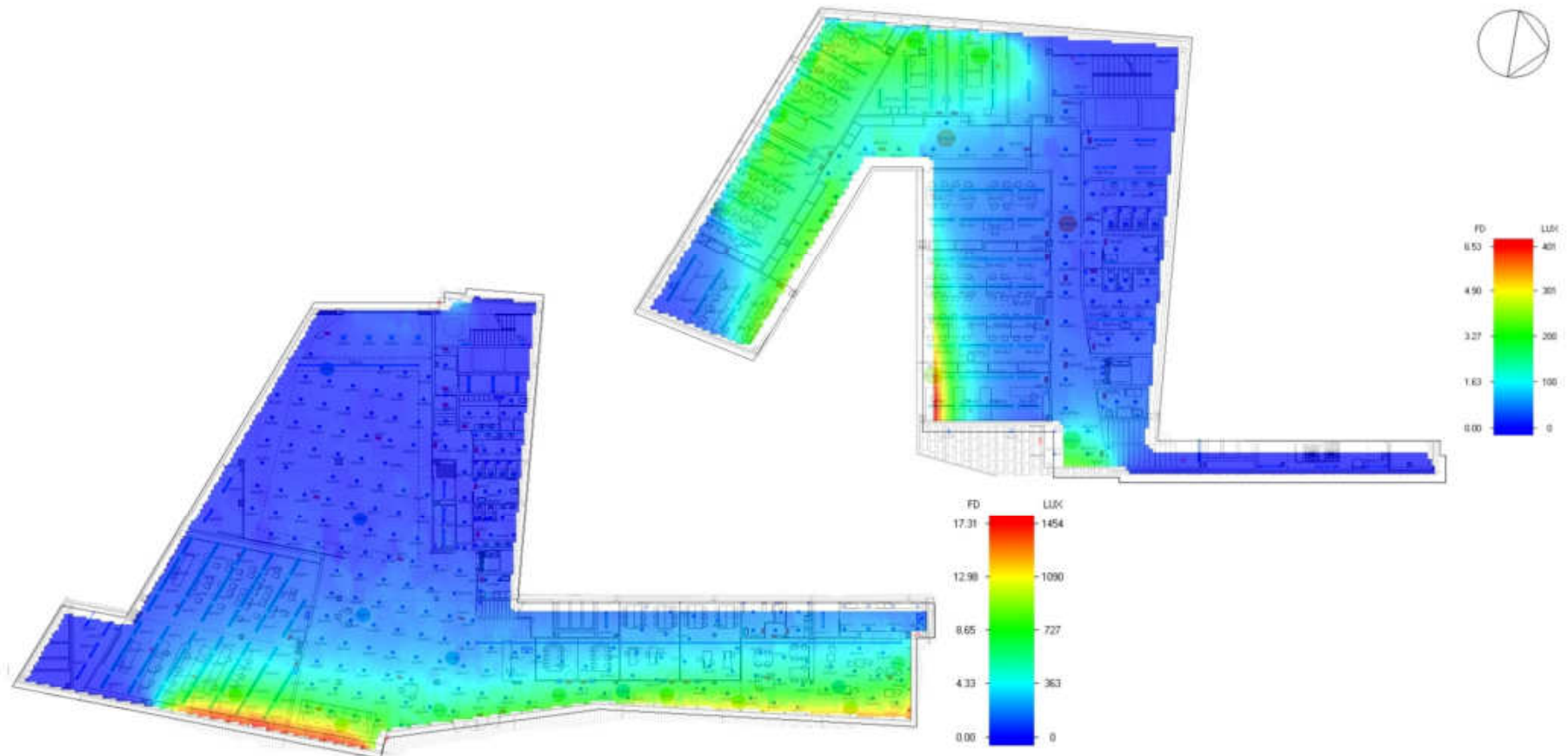
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Page 12 of 13



## INDOOR ENVIRONMENTAL QUALITY (crèdits IEQ)

Es realitza una simulació amb Design Builder segons les especificacions que marca LEED per tal de comprovar el percentatge d'il·luminació natural que aconseguix l'edifici certificat.





Justificació del crèdit

Crédito por Luz Diurna - IEQ 8.1 de LEED v3 NC

El objetivo de los créditos por iluminación natural es reconocer e incentivar diseños que ofrezcan adecuados niveles de luz natural a los usuarios de los edificios.

Un crédito por luz diurna está disponible si al menos el 75% del área habitable de los espacios ocupados cuenta con una adecuada iluminación natural, con un rango de iluminancias entre 25 y 500 fc.

Datos de luz diurna	
Archivo de proyecto	F:\Co2en\backup\DROPBOX\VIAS Polivalent Sant Feliu\Estudi Energetic\DI\SantFeliu.dsb
Fecha y hora de generación del informe	21/01/2014 18:56:23
Modelo de cielo	CIE día claro
Hora 1	9:00
Hora 2	15:00
Ubicación	BARCELONA AIRPORT
Altura del plano de trabajo (m)	0,750
Dimensión máxima de malla (m)	0,200
Dimensión mínima de malla (m)	0,100
Límite inferior de iluminancia (lux)	110,000
Límite superior de iluminancia (lux)	5400,000

Resumen de resultados, valores promedios para las 9:00 y las 15:00 horas	
Área total (m2)	1381,280
Área total dentro del límite (m2)	897,160
% de área dentro de los límites de iluminancia	65,0
Estatus del Crédito IEQ 8.1 de LEED v3 NC	NO PASA

Zonas elegibles para luz diurna, valores promedios para las 9:00 y las 15:00 horas

Zona	Bloque	Área de suelo (m2)	Iluminación mínima (lux)	Área del plano de trabajo dentro de los límites (%)
Zona 1	Bloque 1	953,920	16,2	74,3
Zona 1	Bloque 2	427,360	0,0	44,1
<b>Total</b>		<b>1381,280</b>	<b>0,0</b>	<b>65,0</b>