

ENERGETIC SIMULATION OF A BUILDING IN DIFFERENT LOCATIONS

TECHNICAL ENVIRONMENTAL SYSTEMS
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OpenStudio Project Report

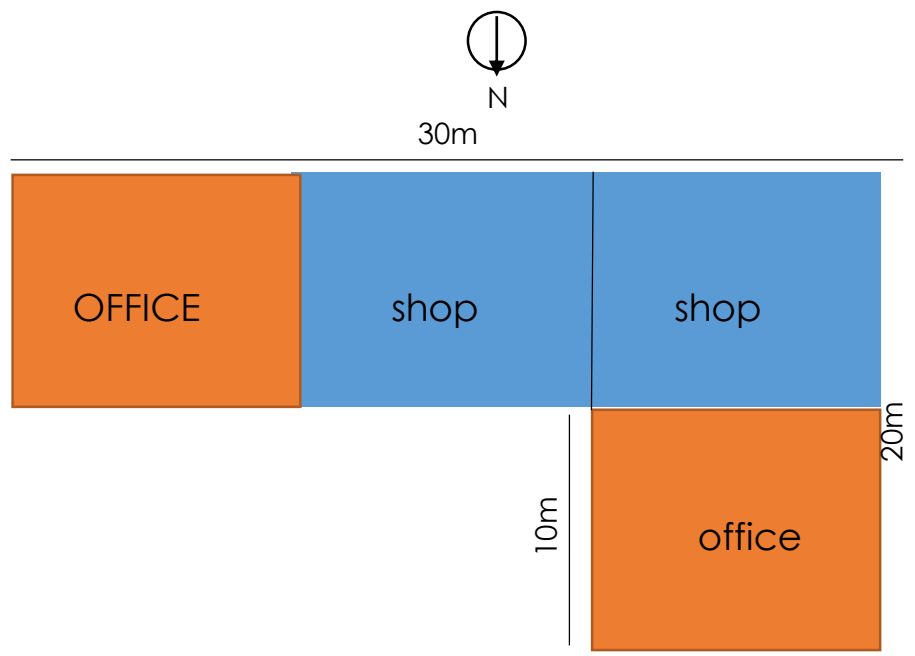
- In this report firstly the thermal behavior of one specific building was examined in three different thermal zones: Oslo(Norway), Abu-Dhabi(United Arab Emirates) and Esfahan(Iran).

In the second part of the report, In one specific location (Abu-Dhabi) three wall typologies with different material were examined in order to analyse its thermal behavior accordingly.

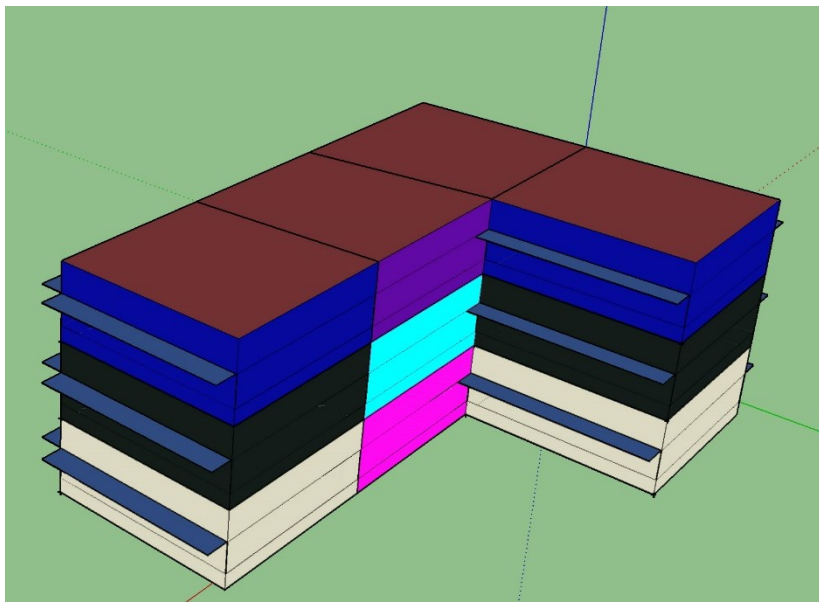


GENERAL DATA

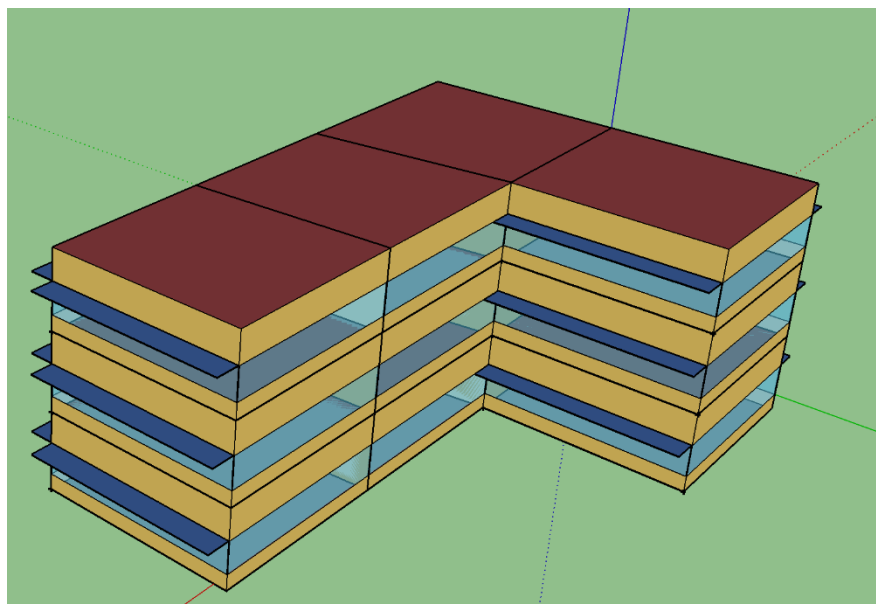
PLAN



THERMAL ZONES



PERSPECTIVE



Building Area

	Area [m2]
Total Building Area	1200.00
Net Conditioned Building Area	1200.00
Unconditioned Building Area	0.00

- NUMBER OF FLOORS: 3
- FLOOR HEIGHT: 4 m
- WINDOW TO WALL RATIO: 0,7
- OFFSET ABOVE FLOOR: 0,70m
- OVERHANGS PROJECTION FACTOR: 0,8m
- TOTAL THERMAL ZONES: 6

We focused on Abu-Dhabi as the main location for the project, and we analysed in three different conditions

Here is information about the first condition in **Abu-Dhabi (wall-1)**

Site and Source Energy

	Total Energy [GJ]	Energy Per Total Building Area [MJ/m2]	Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy	1086.59	905.49	905.49
Net Site Energy	1086.59	905.49	905.49
Total Source Energy	1805.45	1504.55	1504.55
Net Source Energy	1805.45	1504.55	1504.55

End Uses

	Electricity [GJ]	Natural Gas [GJ]	Additional Fuel [GJ]	District Cooling [GJ]	District Heating [GJ]	Water [m3]
Heating	0.00	0.00	0.00	0.00	5.76	0.00
Cooling	0.00	0.00	0.00	775.97	0.00	0.00
Interior Lighting	148.47	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	156.38	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	0.00	0.00
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	304.85	0.00	0.00	775.97	5.76	0.00

Note: District heat appears to be the principal heating source based on energy usage.

Here is information about the first condition in Abu-Dhabi (wall-2)

Site and Source Energy

	Total Energy [GJ]	Energy Per Total Building Area [MJ/m2]	Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy	1107.08	922.57	922.57
Net Site Energy	1107.08	922.57	922.57
Total Source Energy	1824.04	1520.03	1520.03
Net Source Energy	1824.04	1520.03	1520.03

End Uses

	Electricity [GJ]	Natural Gas [GJ]	Additional Fuel [GJ]	District Cooling [GJ]	District Heating [GJ]	Water [m3]
Heating	0.00	0.00	0.00	0.00	4.57	0.00
Cooling	0.00	0.00	0.00	797.66	0.00	0.00
Interior Lighting	148.47	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	156.38	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	0.00	0.00
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	304.85	0.00	0.00	797.66	4.57	0.00

Note: District heat appears to be the principal heating source based on energy usage.

Here is information about the first condition in Abu-Dhabi (wall-3)

Site and Source Energy

	Total Energy [GJ]	Energy Per Total Building Area [MJ/m2]	Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy	1107.08	922.57	922.57
Net Site Energy	1107.08	922.57	922.57
Total Source Energy	1824.04	1520.03	1520.03
Net Source Energy	1824.04	1520.03	1520.03

End Uses By Subcategory

	Subcategory	Electricity [GJ]	Natural Gas [GJ]	Additional Fuel [GJ]	District Cooling [GJ]	District Heating [GJ]	Water [m3]
Heating	General	0.00	0.00	0.00	0.00	4.57	0.00
Cooling	General	0.00	0.00	0.00	797.66	0.00	0.00
Interior Lighting	General	148.47	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	General	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	General	156.38	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	General	0.00	0.00	0.00	0.00	0.00	0.00
Fans	Ventilation (simple)	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	General	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	General	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	General	0.00	0.00	0.00	0.00	0.00	0.00
Refrigeration	General	0.00	0.00	0.00	0.00	0.00	0.00
Generators	General	0.00	0.00	0.00	0.00	0.00	0.00

Here is information about the first condition in Oslo

Site and Source Energy

	Total Energy [GJ]	Energy Per Total Building Area [MJ/m2]	Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy	1031.88	859.90	859.90
Net Site Energy	1031.88	859.90	859.90
Total Source Energy	3540.18	2950.15	2950.15
Net Source Energy	3540.18	2950.15	2950.15

End Uses

	Electricity [GJ]	Natural Gas [GJ]	Additional Fuel [GJ]	District Cooling [GJ]	District Heating [GJ]	Water [m3]
Heating	0.00	0.00	0.00	0.00	706.59	0.00
Cooling	0.00	0.00	0.00	20.44	0.00	0.00
Interior Lighting	148.47	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	156.38	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	0.00	0.00
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	304.85	0.00	0.00	20.44	706.59	0.00

Note: District heat appears to be the principal heating source based on energy usage.

Here is information about the first condition in **Esfahan**

Site and Source Energy

	Total Energy [GJ]	Energy Per Total Building Area [MJ/m2]	Energy Per Conditioned Building Area [MJ/m2]
Total Site Energy	725.09	604.24	604.24
Net Site Energy	725.09	604.24	604.24
Total Source Energy	1888.09	1573.41	1573.41
Net Source Energy	1888.09	1573.41	1573.41

End Uses

	Electricity [GJ]	Natural Gas [GJ]	Additional Fuel [GJ]	District Cooling [GJ]	District Heating [GJ]	Water [m3]
Heating	0.00	0.00	0.00	0.00	187.28	0.00
Cooling	0.00	0.00	0.00	232.96	0.00	0.00
Interior Lighting	148.47	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	0.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	156.38	0.00	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	0.00	0.00
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	304.85	0.00	0.00	232.96	187.28	0.00

Note: District heat appears to be the principal heating source based on energy usage.

Thank you



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