

# Case Studies

Presented by Paul Kenny, Tipperary Energy Agency



# Case Study 670m<sup>2</sup> National School

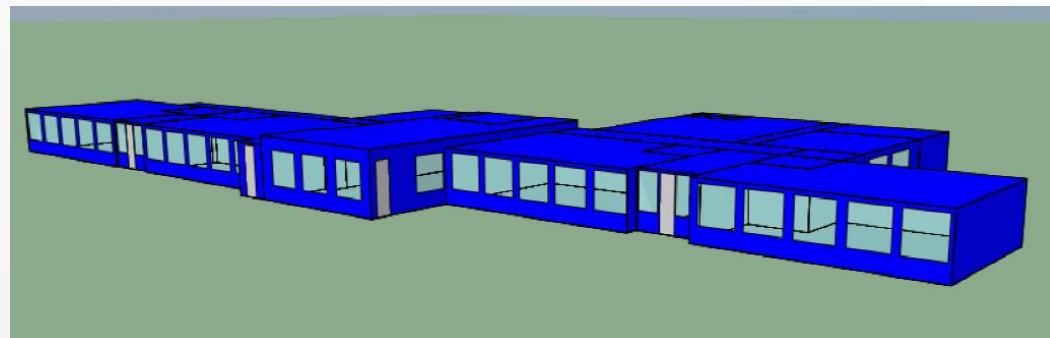


- » Existing 100kW oil boiler, partial control (3 zones) on a one-pipe heating distribution network.
- » Space conditions not met in gable classrooms with mould growth and moisture damage in some rooms
- » 300mm insulation in attic, double glazed windows (2004 upgrade) door upgrade (2011) with solid block external walls and infill walls
- » Energy costs - €4,850



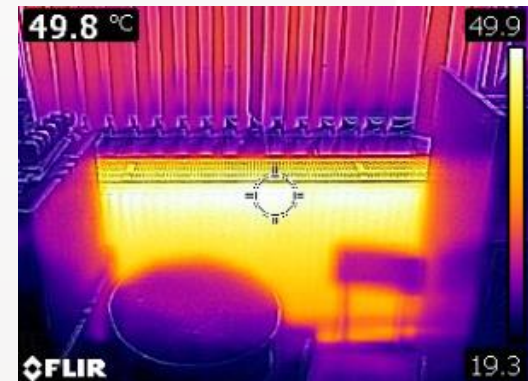
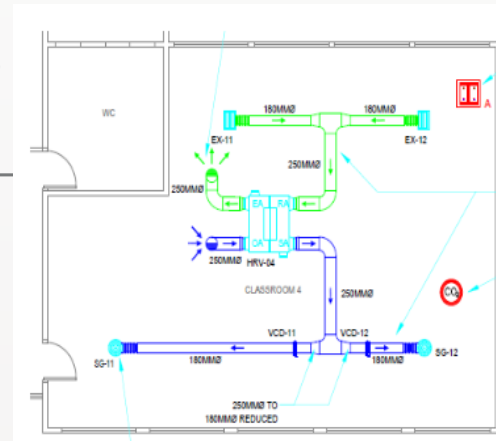
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- » 3 No. Air to water heat pumps  
14kW capacity in cascade configuration.
- » Upgraded all pipework and radiators to comply with DoES Technical Guidance Documents (2 port valve control in classrooms)
- » External Wall Insulation (EWI) to both gable ends (spaces with mould growth)
- » Mechanical ventilation heat recovery to each classroom
- » Sealing of all windows and services entries
- » Installation of a 3kW solar PV array
- » Capital costs - €120,000



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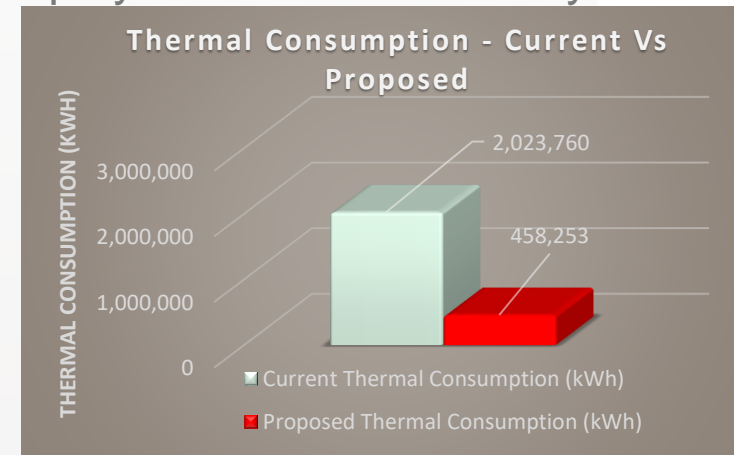
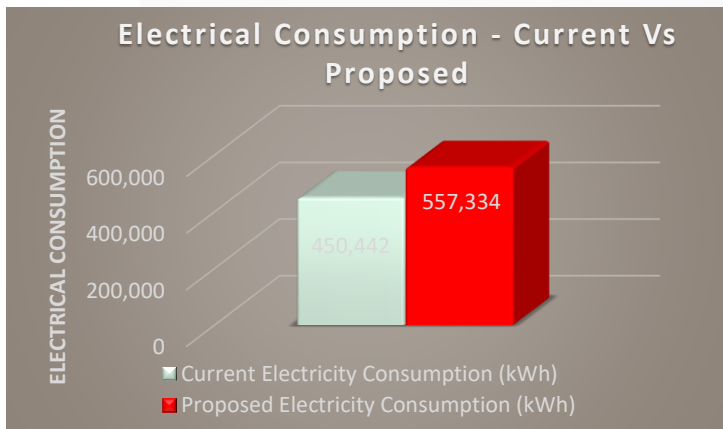
- » Cost Savings Approx. €3,000-€3,400
- » Proper commissioning, radiators not correctly balanced
- » Buffer tank plumbed incorrectly
- » HRV system not commissioned, on full supply and extract mode
- » Control optimisation
- » Heat pump projects should be engineered by experienced professionals
- » 100% renewable solution for this type of building
- » MIC Increase required to 29kVA – single phase. At the limit for this application before large standing charges would be applied



# Case Studies - Lahinch

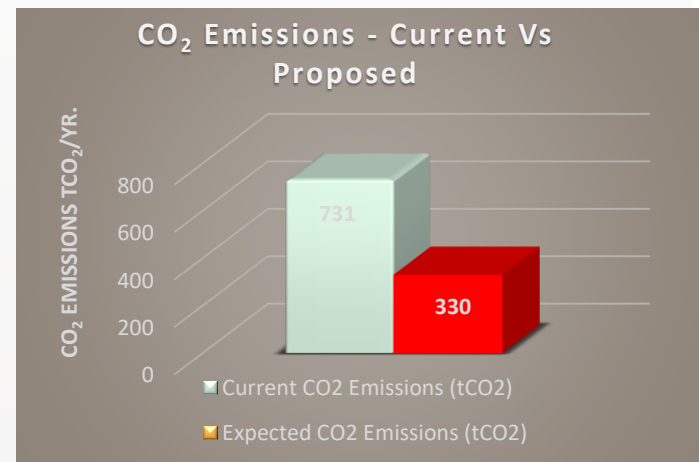
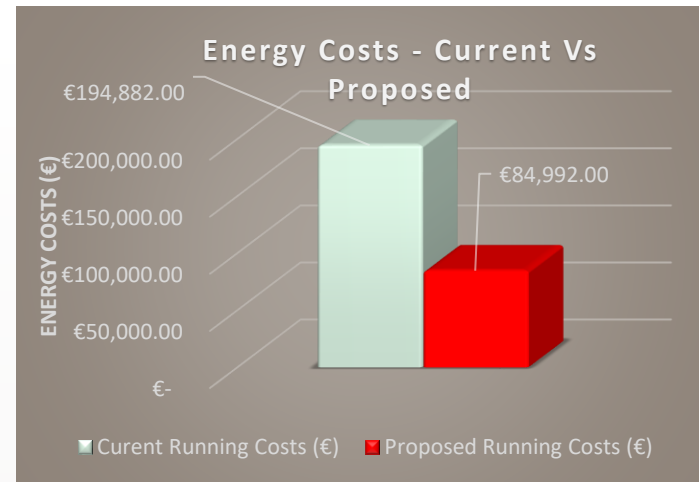


- » Existing Build **E** Energy Rating
- » Proposed Retrofit Achieving Best in Class **A2** Energy Rating (NZEB Status Leisure Centre)
- » **315 kWh/m<sup>2</sup>/yr.** primary energy consumption vs **1,707 kWh/m<sup>2</sup>/yr.** for existing structure and systems
- » **24% increase** in electrical consumption but heating, cooling & ventilation now provided to complete facility (Additional conditioned space 800m<sup>2</sup> approximately)
- » **77% decrease** in thermal consumption
- » Heat costs minimised through geothermal heat pump system & heat recovery



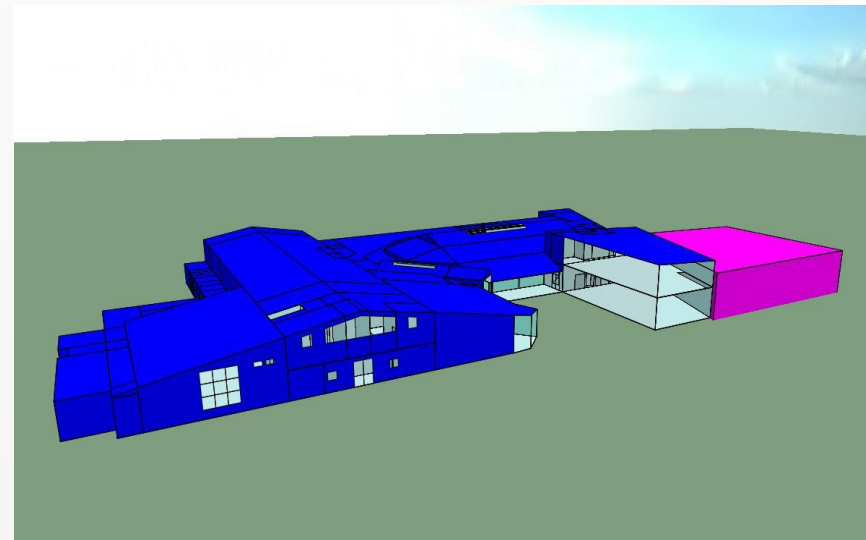
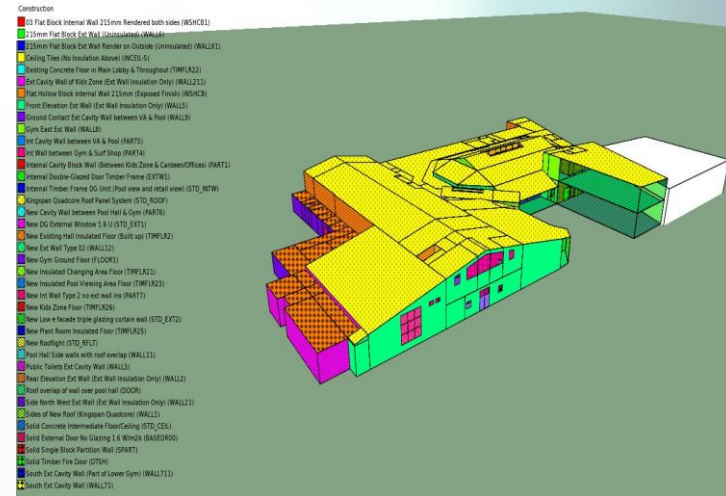
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- » **56%** decrease in energy running costs including SSRH funding)
- » **55%** decrease in CO<sub>2</sub> Emissions
- » Building fabric upgraded to best in class and compliant with current Building Regulations Part L
- » AHU's Upgraded to 80% heat recovery and compliance with NZEB specification & EU Regulation 1253
- » Energy efficient Fan Coil Units system throughout providing simultaneous heating and cooling coupled with heat recovery ventilation.
- » Smart LED lighting throughout the building with daylight sensing and occupancy detection
- » Solar energy used in all electrical systems (18% of electricity)



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- » Ground source heat pump
  - Hot tank (45/35)
  - Cold tank (15/5)
- » Summer cooling loads heating pool and Pre-heat DHW
- » LTHW cct at 50/40 @-3
  - Weather compensation down
  - Fancoils throughout
  - UFCH in changing rooms
  - Heat recovery ventilation and return air heating.
- » De-superheater for DHW (75 Degrees)
- » Biomass for peak, backup, existing AHUs & peak DHW above desuperheater capacity.



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