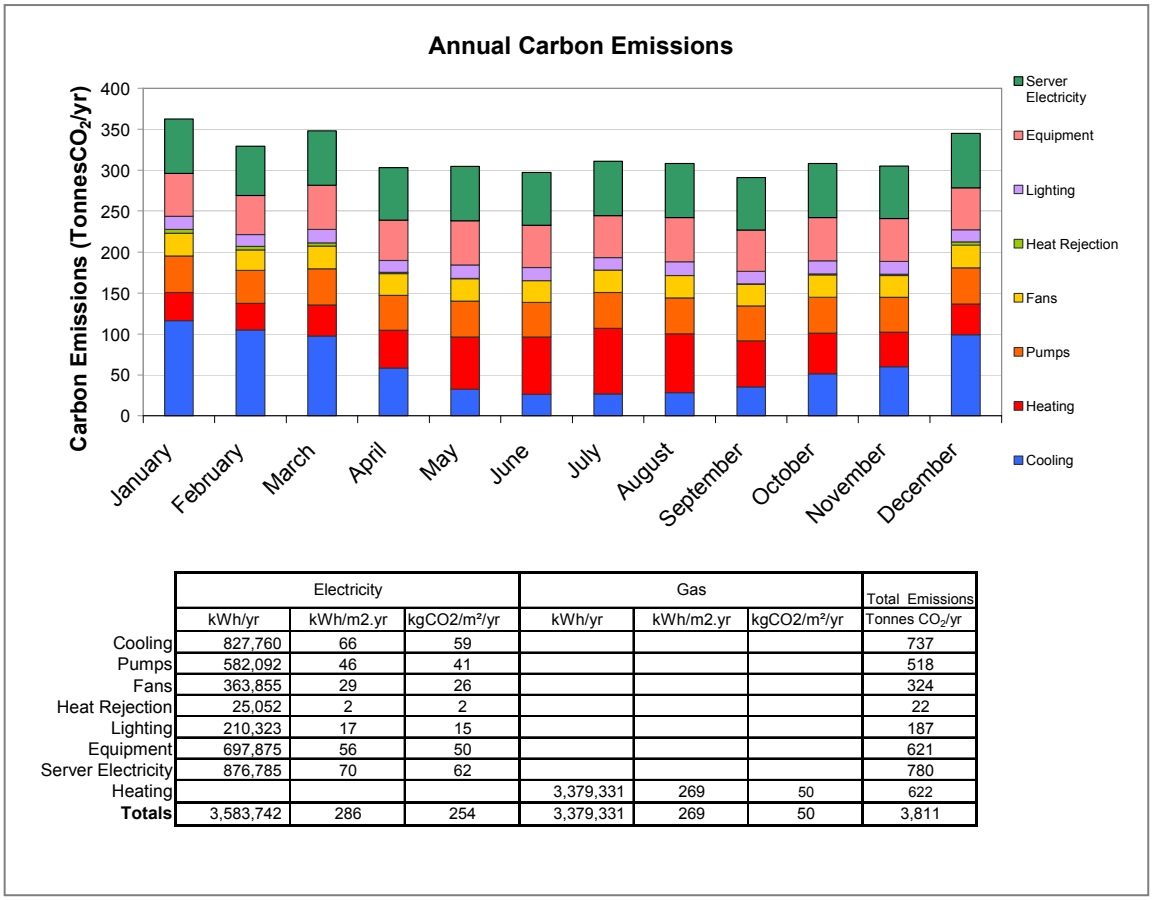
To	David Rann	Reference number	206014/02/PJG
cc	Dan Malone Wojciech Pluta	File reference	
From	Phillip Greenup x 45669 (Melbourne) Jon Morgan Andrew Tsakmakis	Date	11 December 2009
Subject	Hunter Medical Research Institute: Energy Modelling		

This memo is in response to the letter from the Department of Planning dated 24/11/09, reference S08/02042 and 09/00887, in relation to the proposed Hunter Medical Research Institute (HMRI), Newcastle. This document summarises the energy modelling completed and shown in the ESD Schematic Design report, and compares the energy modelling inputs to the proposed mechanical scheme design. Information regarding the mechanical scheme design has been sourced from the HMRI Responsibility Matrix, 4 November 2009.

The annual carbon emissions predicted by the energy model in the ESD schematic report are shown in figure 1. Table 1 lists the key parameters used in the energy model. The model largely reflects the proposed design. The mechanical design also includes extra heat recovery, multi-zone AHUs for labs and night set-back temperatures which would likely reduce the predicted energy consumption of the building. Differences between the energy model and the mechanical scheme design are noted in bold in Table 1.



	Electricity			Gas			Total Emissions
	kWh/yr	kWh/m2.yr	kgCO2/m²/yr	kWh/yr	kWh/m2.yr	kgCO2/m²/yr	Tonnes CO_2/yr
Cooling	827,760	66	59				737
Pumps	582,092	46	41				518
Fans	363,855	29	26				324
Heat Rejection	25,052	2	2				22
Lighting	210,323	17	15				187
Equipment	697,875	56	50				621
Server Electricity	876,785	70	62				780
Heating				3,379,331	269	50	622
Totals	3,583,742	286	254	3,379,331	269	50	3,811

Figure 1: Energy Modelling Results

	Perimeter Offices	Centre Offices	Laboratories
Ventilation (Outside Air)	1 ACH (min)	1 ACH (min)	12ACH (100% O/A)
AHU Fan: Control Type	***Constant Speed*** (Modelled: VAV)	***Constant Speed*** (Modelled: VAV)	Constant Speed
Zone Reheat	Hot Water Reheat	Hot Water Reheat	***None*** (Modelled: Hot Water Reheat)
Economy Cycle	Temperature Control	Temperature Control	None
Heat Recovery: Sensible heat efficiency	***Included in design*** (Modelled: None)	***Included in design*** (Modelled: None)	40% (Run-around Coil) N/A for Vivariums
Night time set-backs	***Included in design*** (Modelled: None)		
Chiller: Control	Variable Speed		
Chilled Water Circuit: Control	Variable Speed Drive		
Heating Hot Water Circuit: Control	Variable Speed Drive		
Condenser Water circuit: Control	Constant Speed		

Table 1: Key Model Inputs