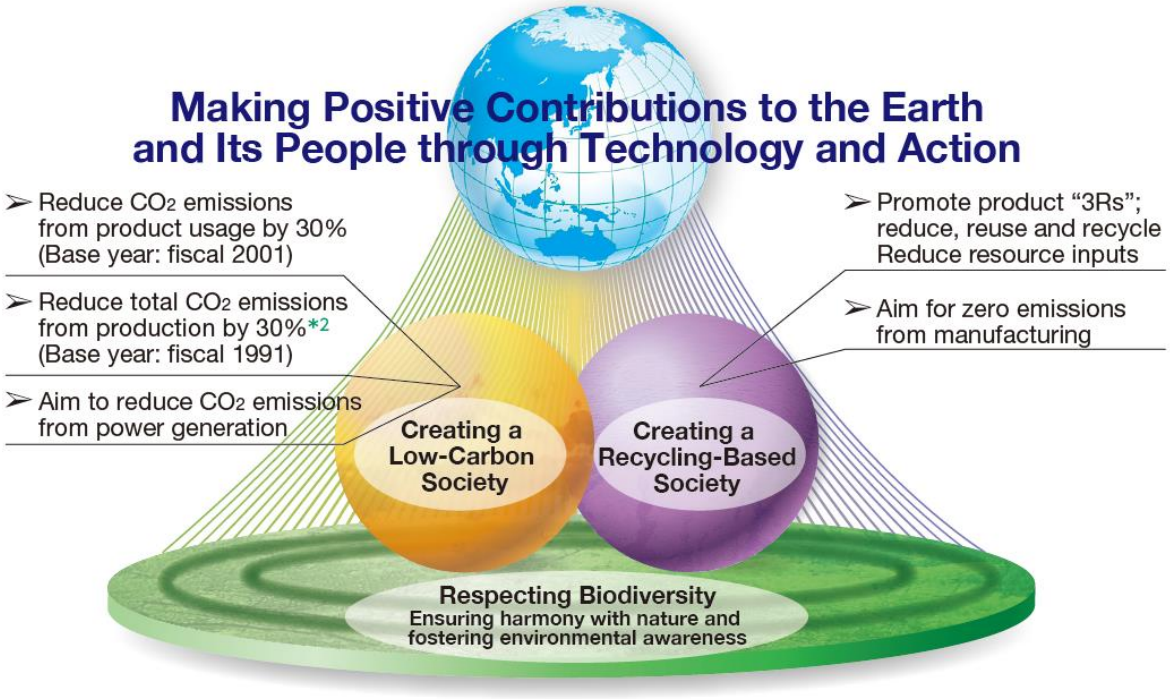
Sustainability & Construction Team

MITSUBISHI ELECTRIC

EPDs & Embodied Carbon from a Manufacturer's perspective

Presented By: Chris Newman – Zero Carbon Design Manager

ON THE ROAD TO NET ZERO



*2 Mitsubishi Electric Corporation: Base year fiscal 1991;
Affiliated companies in Japan: Base year fiscal 2001;
Affiliated companies outside Japan: Base year fiscal 2006

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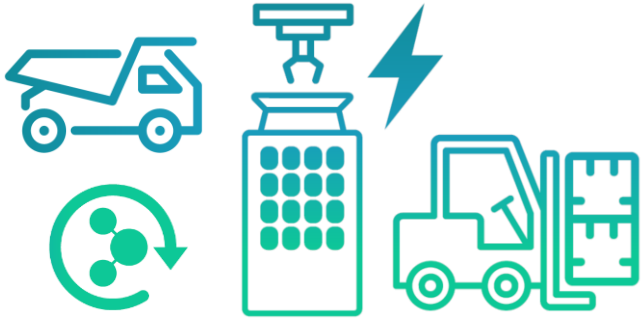
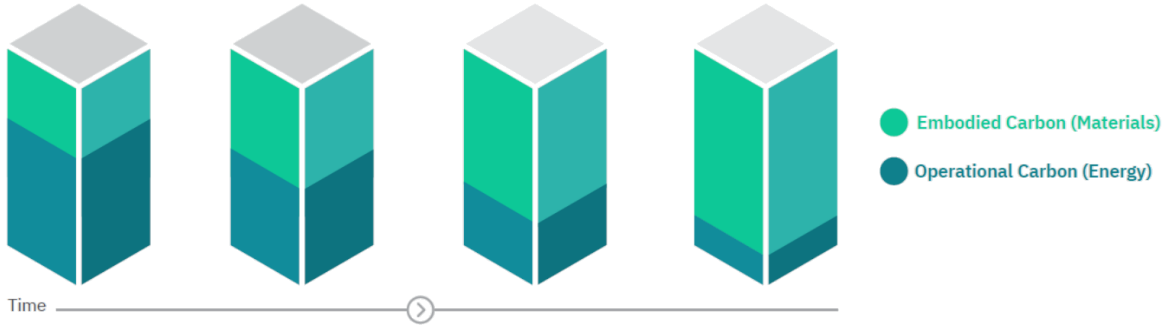
Environmental Sustainability Vision 2050

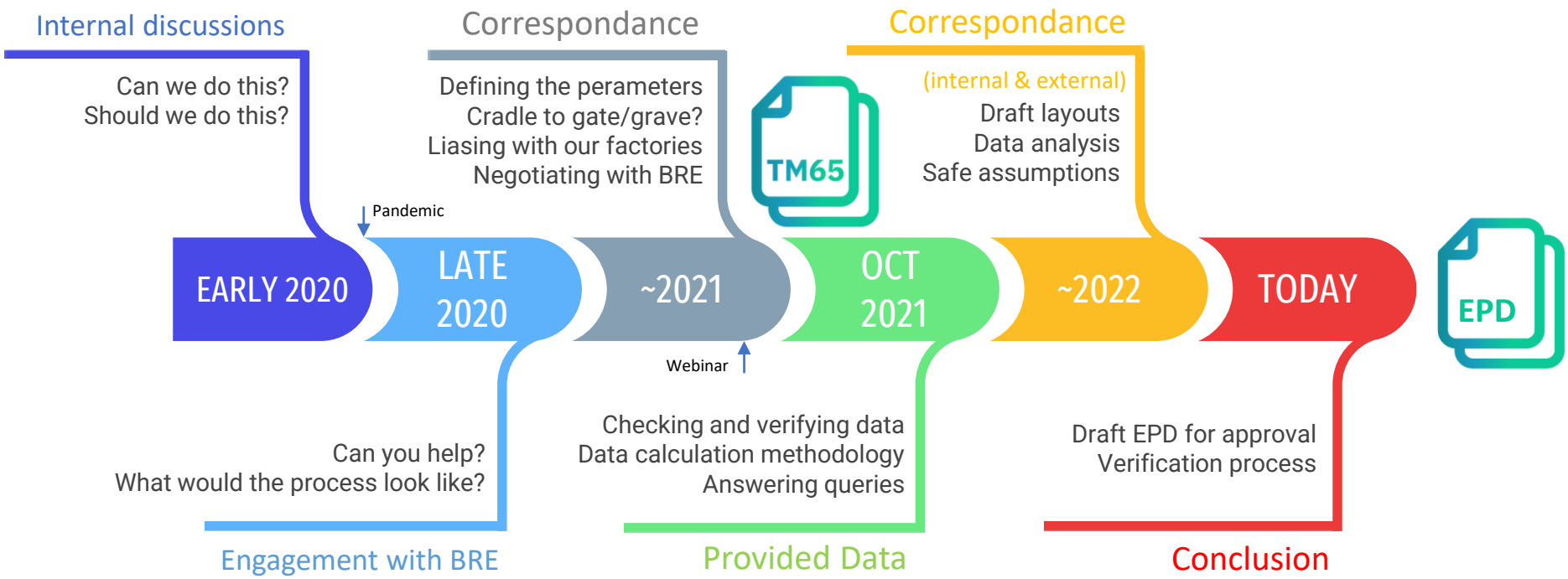
Resource circulation

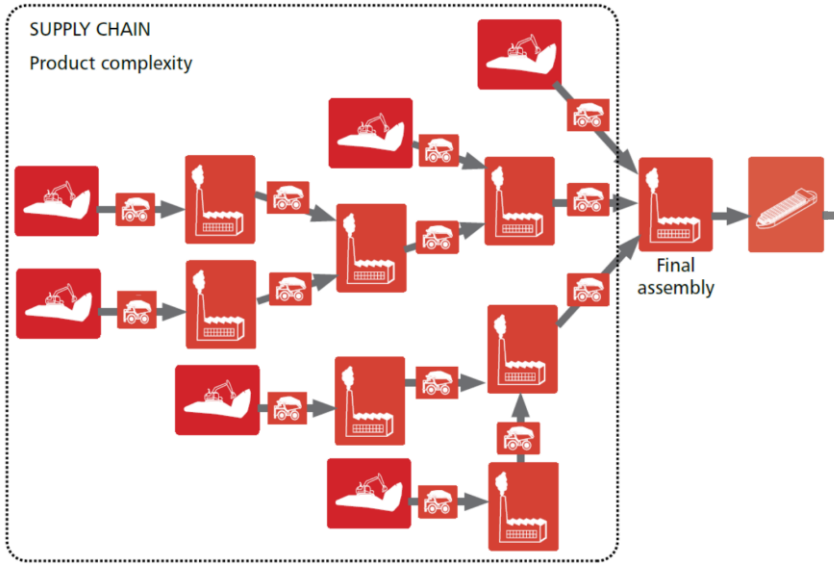
Reducing the size and weight of products, we will consider the use of recycled materials and the recyclability rate of the products and systems we produce

- European market typically leads with legislative/complience requirements (e.g. ERP)
- Product Environmental Passport (PEP) in France is good example of this (requirement from Jan 2022)
- Requirement to document and understand raw material makeup, manufacturing energy and packaging
- PEP allows interpolation by weight of similar products within a range – important for large manufacturers
- PEP provided a template and an element of standardisation on important assumptions (e.g. lifecycle)

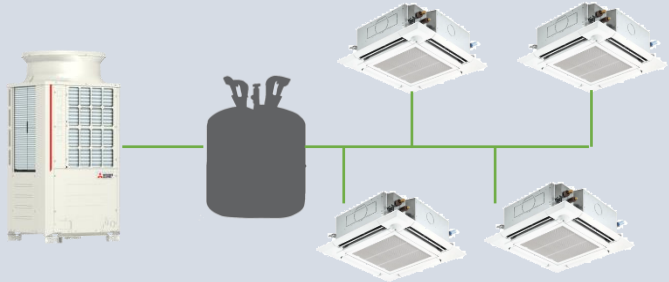




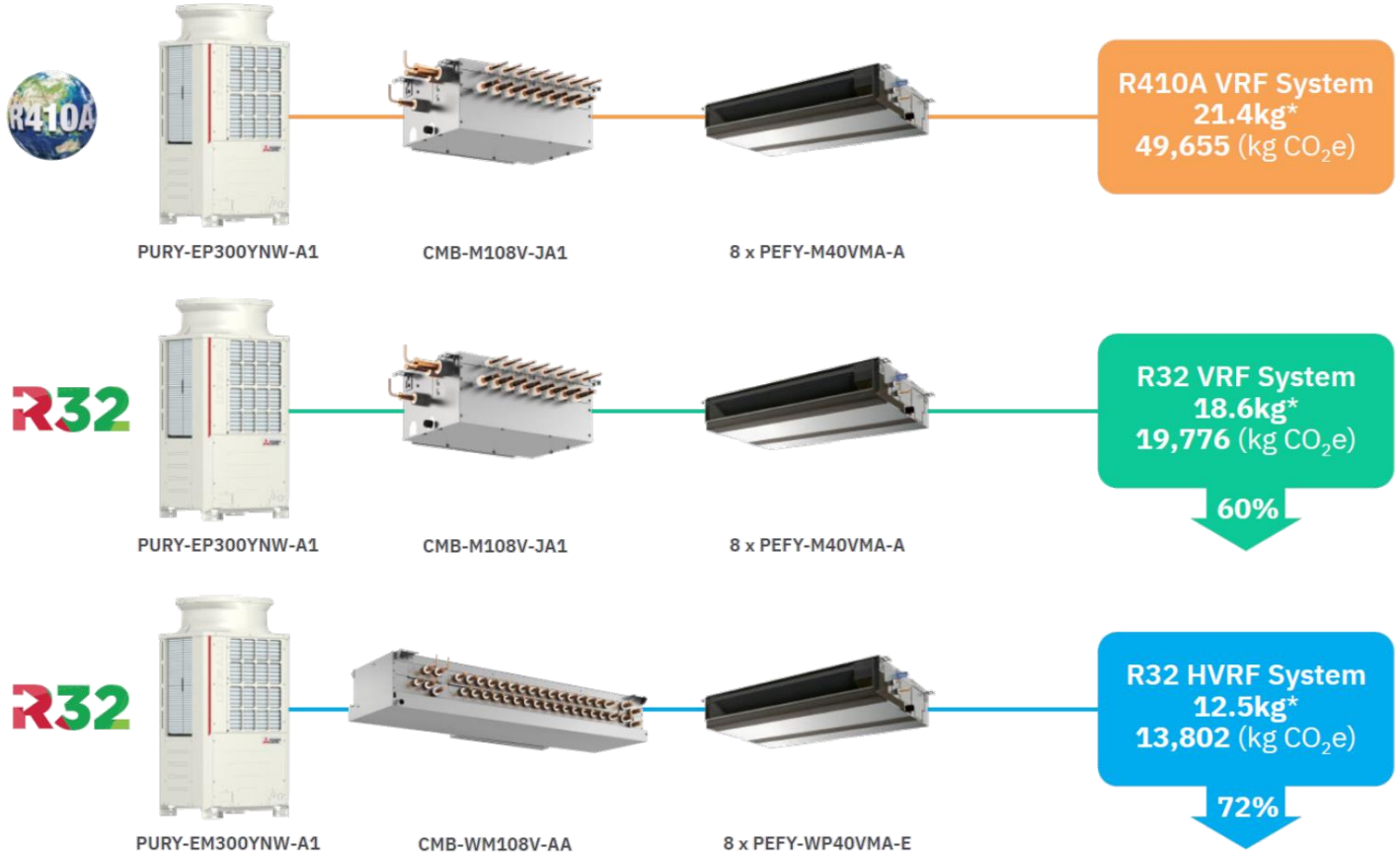


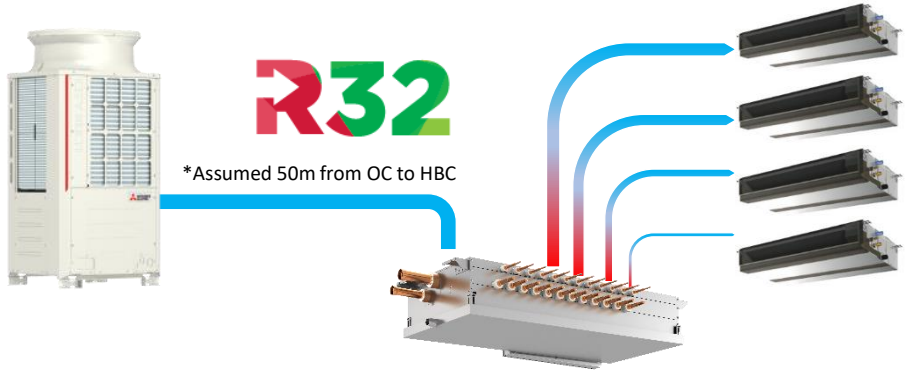


Equipment manufacture, refrigerant base charge and transport etc. covered by TM65 calculation



Site added refrigerant not covered by TM65 calculation





Total Embodied Carbon

R32 HVRF System
12.5kg*
13,802 (kg CO_2e)

72%

5,907 Kg

- Example 30KW HVRF Outdoor Unit
- R32 Base Charge

4,583 Kg

- Additional 7.3Kg Site Added Refrigerant Charge

848 Kg

- Branch Controller Box

2,464 Kg

- 8 x 4KW Hybrid Ducted Units

- Outdoor Unit (Excluding Base Charge)
- Outdoor Unit Base Refrigerant Charge
- Additional Refrigerant Charge
- Hybrid Branch Controller Box
- Hybrid Indoor Units

$kgCO_2e$	R410A VRF		R32 VRF		R32 HVRF	
Outdoor unit + Factory Charge Refrigerant	PURY-EP300YNW-A1 + 5.2kg Refrigerant	12,741	PURY-EM300YNW-A1 + 5.2kg Refrigerant	5,907	PURY-EM300YNW-A1 + 5.2kg Refrigerant	5,907
Site Added Refrigerant	+ 16.2kg Refrigerant	31,457	+ 13.4kg Refrigerant	8,412	+ 7.3kg Refrigerant	4,583
BC Box	CMB-M108V-JA1	545	CMB-M108V-JA1	545	CMB-WM108V-AA	848
Indoor Units	8 x PEFY-M40VMA-A	(8 x 614) 4912	8 x PEFY-M40VMA-A	(8 x 614) 4912	8 x PEFY-WP40VMA-E	(8 x 308) 2464
Total Embodied Carbon	49,655		19,776		13,754	
Embodied Carbon per kW	1,655		659		460	
Approximate Embodied Carbon Reduction	Baseline		60%		72%	

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City Multi VRF / Hybrid VRF Outdoor Units

Model	Description	Cooling Capacity (kW)	TM65 Mid Display ($kgCO_2e$)
PURY-EM200YNW-A1	Heat Recovery High Efficiency R32	22.4	5,907
PURY-EM250YNW-A1	Heat Recovery High Efficiency R32	28.0	5,907
PURY-EM300YNW-A1	**Heat Recovery High Efficiency R32**	**33.5**	**5,907**
PURY-EM350YNW-A1	Heat Recovery High Efficiency R32	40.0	6,979
PURY-EM400YNW-A1	Heat Recovery High Efficiency R32	45.0	7,074
PURY-EM450YNW-A1	Heat Recovery High Efficiency R32	50.0	7,670
PURY-EM500YNW-A1	Heat Recovery High Efficiency R32	56.0	8,694

Commercial Heat Pumps & Chillers

Model	Description	Cooling / Heating Capacity (kW)	TM65 Mid Display ($kgCO_2e$)
EAHV-M1500YCL-N	**Modular Air Source Heat Pump R32**	**150 / 150**	**23,831**
EAHV-M1800YCL-N	Modular Air Source Heat Pump R32	180 / 180	23,831
CAHV-P500YB-HPB	**Ecodan Air Source Heat Pump R407c**	**- / 42.6**	**11,273**
QAHV-N560YA-HPB	**Ecodan Air Source Heat Pump R744**	**- / 40**	**3,619**
EHWT17D-MHEDW	**Hydrodan Water to Water Heat Pump R32**	**- / 8.0**	**1,399**

Note. all other calculations have been interpolated from the reference Model highlighted

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Thank you

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