



# + Technology Transition - Transportation



- **Government Targets**
- **Duty Cycles / Ranges**
- **Operational Requirements**
- **Infrastructure** (charging/ Fuelling)
- **Resources Available**
- **Total Cost of Investment - WLC**
- **Future Proofing-** eg Waste Strategy
- **Health & Safety/ Legislation**

# CONSIDERATIONS

PROPULSION SYSTEMS

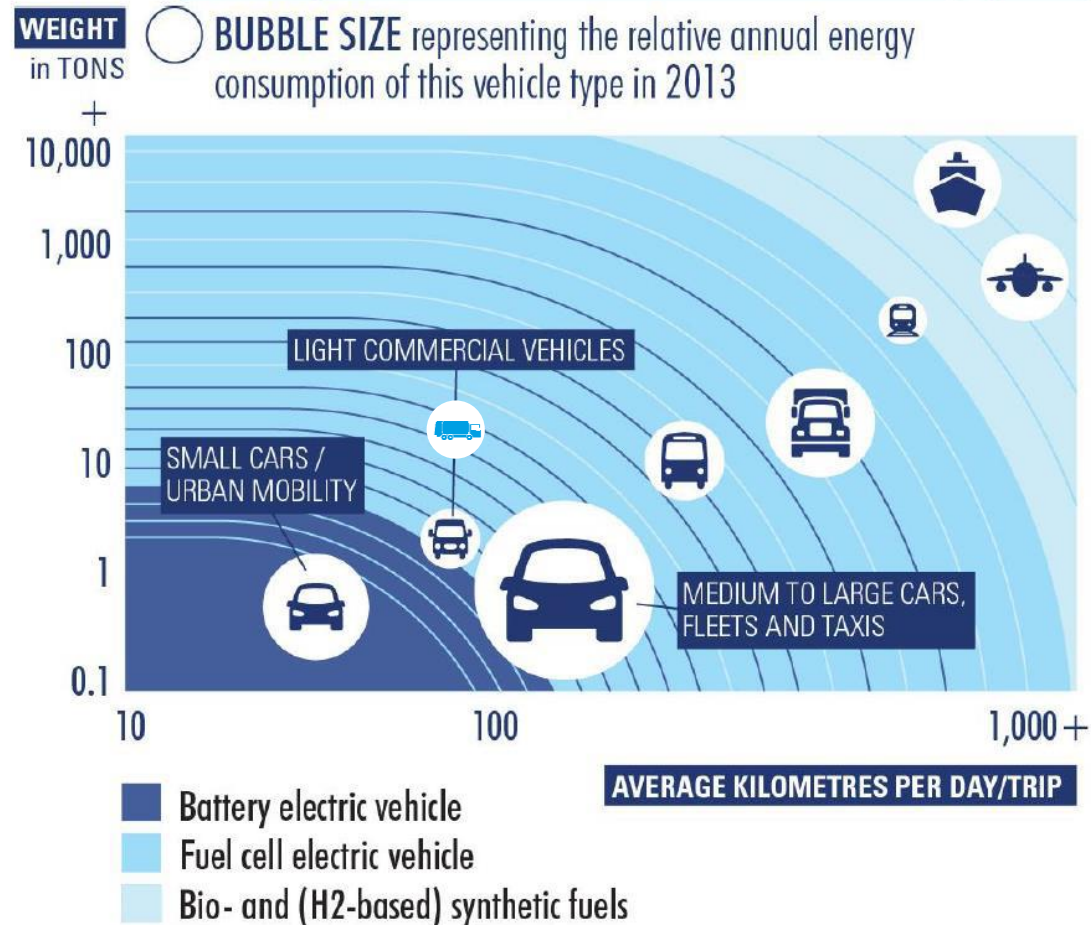
**+** **Battery Electric Vehicles vs Fuel Cell Electric Vehicles**  
 Although fuel cell systems and batteries are seen by some as competing technologies, they are actually complimentary technologies, that both offer different advantages depending on use-cases, cost and regulations.

**+** **Different Vehicles will be better suited to differing propulsion systems.**

**Small cars / Urban mobility** might be better suited to BEV propulsion as they are light weight,. Have lower energy usage needs and cover less distance.

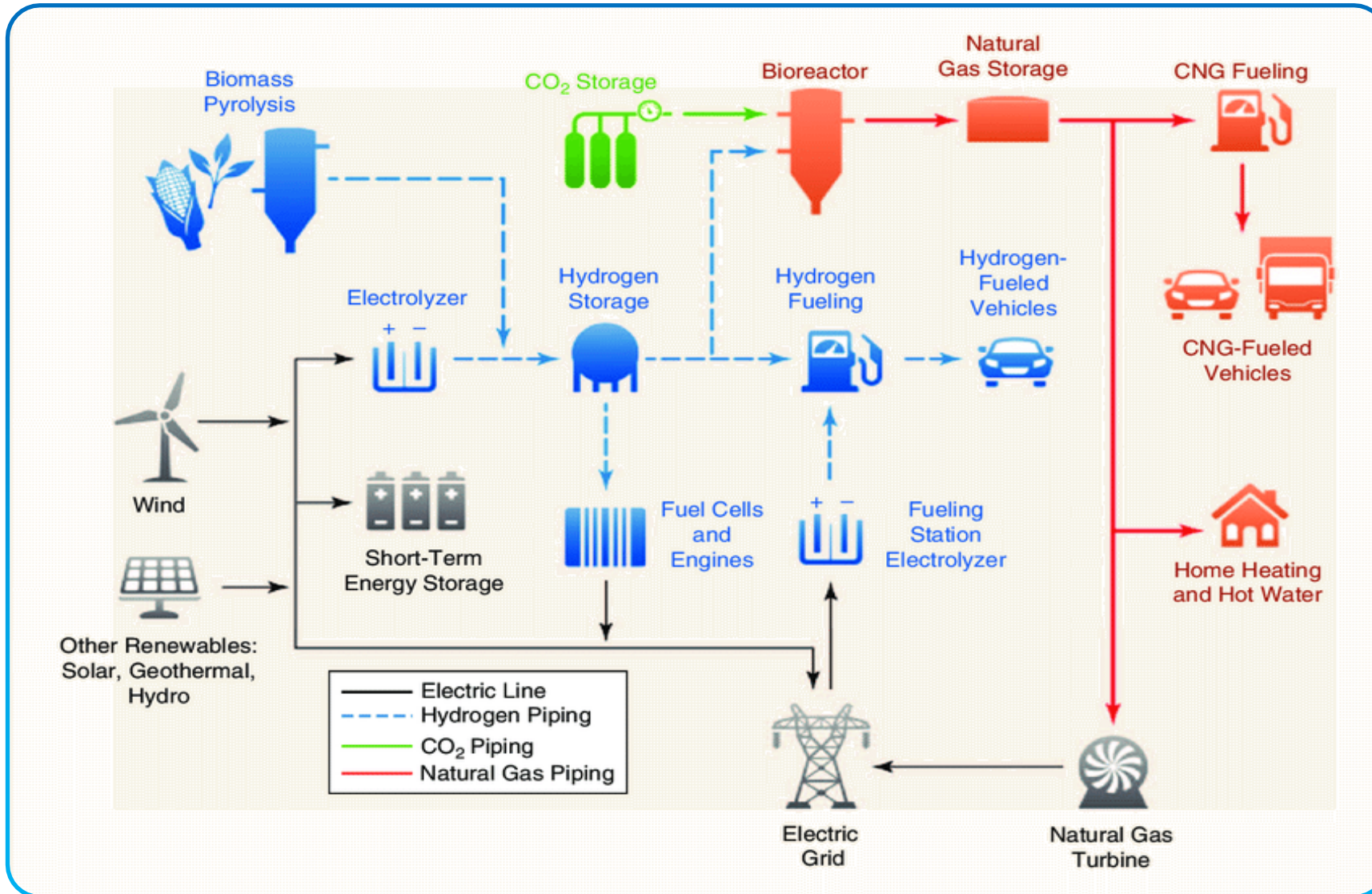
**Heavier larger vehicles** covering larger distances with higher energy demands will be better suited to FCEV propulsion.

**Large Ships & Aircraft** might suit Bio and H2 based synthetic fuels





## RENEWABLE ENERGY PATHWAYS OF HYDROGEN



WORKING PRINCIPAL FUEL CELL



— WHAT IS BLUEPOWER





Tanks and Fuel Cells in the Chassis

Auxiliary Equipment installed as Normal

Cement Mixer / Fridge Box etc



Built in Full Commercial & Technical cooperation with Daimler AG

Full Manufacturing responsibility with FAUN – Warranty etc

OEM Status – WK7

— VARIOPRESS ANIMATION



# VARIOPRESS

**ZUVERLÄSSIG  
FORTSCHRITTLICH**

**RELIABLE  
PROGRESSIVE**

 **FAUN**  
KIRCHHOFF GRUPPE



— ROTOPRESS ANIMATION



**ROTOPRESS**

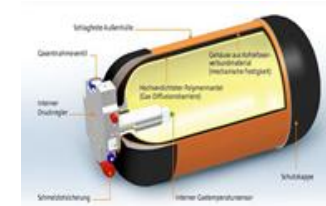
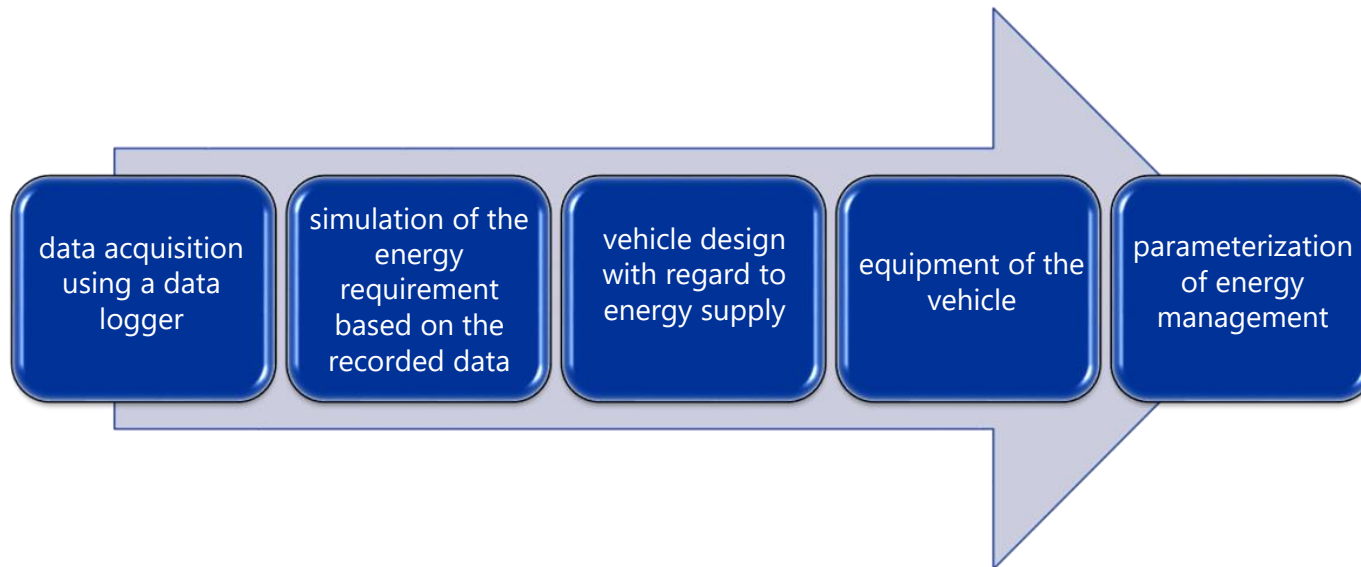
**ZUVERLÄSSIG  
FORTSCHRITTLICH**

**RELIABLE  
PROGRESSIVE**

 **FAUN**  
KIRCHHOFF GRUPPE

**BLUEPOWER Competence**

Adapt energy concept to local requirement based on real data



	Wed 16/12	Tue 24/11	Wed 25/11	Mon 16/11	Mon 23/11
Duration (h:m)	9:33	9:36	10:29	8:26	9:16
Distance (miles)	205	120.5	109.3	105.6	80.2
Fuel used	124.2	93.5	85.9	80.5	74.3
Energy used (KW/h)	406.19	306	281	263.12	243.22
Total single bins	406	289	253	267	349
Total compactions	279	637	595	655	695

	Tue 17/11	Tue 08/12	Mon 14/12	Thurs 03/12	Wed 02/12
Duration (h:m)	8:09	8:54	6:45	7:50	7:00
Distance (miles)	97.6	83.9	84.5	55.9	65.8
Fuel used	74.2	74.1	66.6	59.8	58.6
Energy used (KW/h)	242.72	242.31	218.05	195.59	191.89
Total single bins	216	615	508	820	251
Total compactions	596	490	295	560	433

	Thurs 19/11	Wed 09/12	Wed 18/11	Tue 01/12	Thurs 26/11
Duration (h:m)	8:06	7:15	6:57	6:21	7:13
Distance (miles)	55.9	63.4	65.2	54.7	55.3
Fuel used	58.3	57.5	57.1	54.7	54.5
Energy used (KW/h)	190.75	188.35	186.84	179.11	178
Total single bins	253	592	204	211	251
Total compactions	759	428	587	395	410

	Mon 07/12	Mon 30/11	Fri 27/11	Thurs 10/12	Tue 15/12
Duration (h:m)	6:49	6:22	7:15	6:02	6:11
Distance (miles)	50.9	59.1	42.1	54.6	54.1
Fuel used	53.7	53.4	42.1	47.6	45.0
Energy used (KW/h)	175.7	174.56	156.2	155.77	147.25
Total single bins	695	251	259	475	468
Total compactions	457	427	519	374	315

	Fri 20/11	Fri 04/12	Fri 11/12	Fri 18/12	Thurs 17/12
Duration (h:m)	6:58	6:14	5:48	0:22	n/a
Distance (miles)	34.2	23.7	30.5	7.5	n/a
Fuel used	43.8	37.8	36.0	3.8	n/a
Energy used (KW/h)	143.34	123.64	117.81	12.54	n/a
Total single bins	274	709	535	n/a	n/a
Total compactions	653	380	384	n/a	n/a

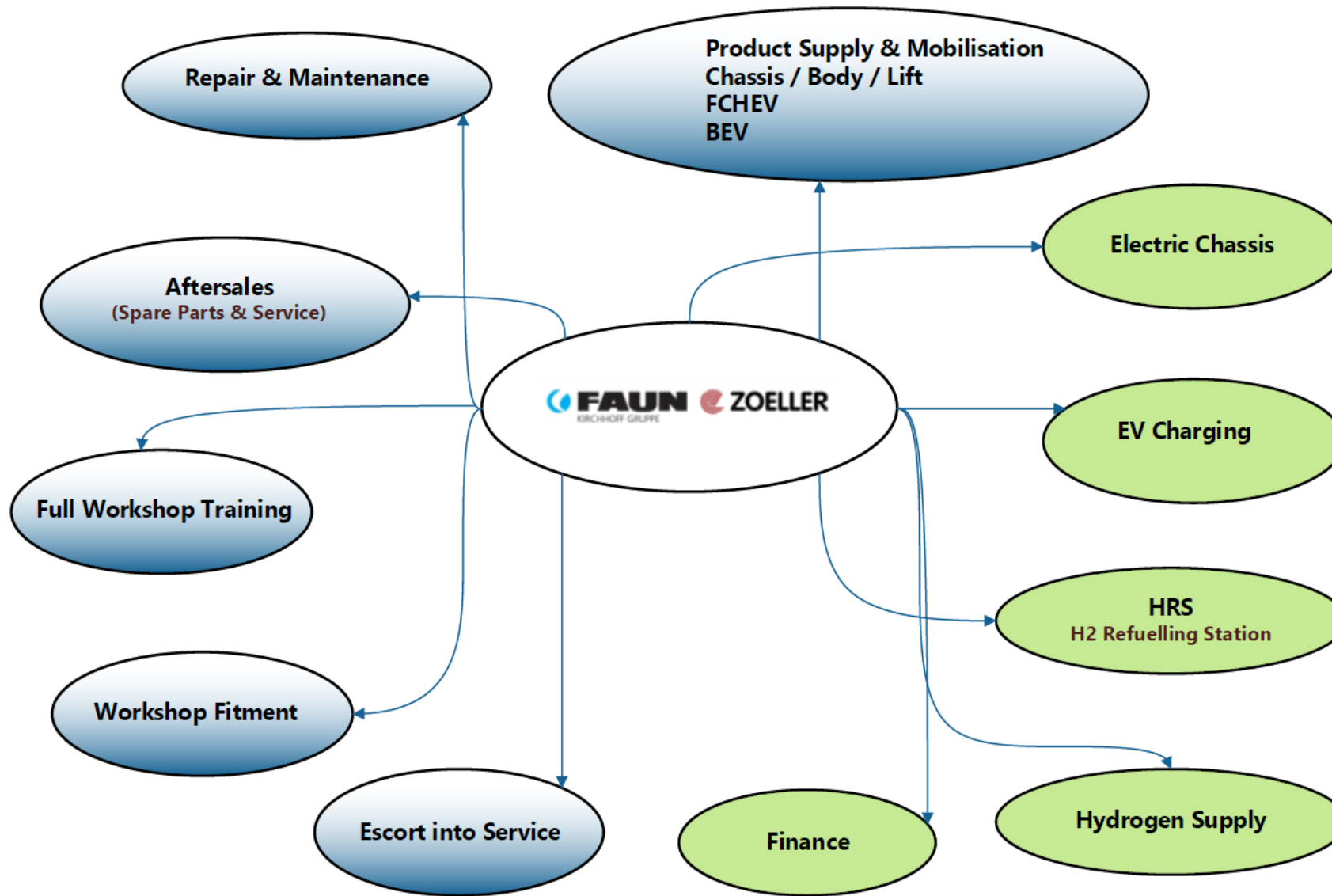
Key:  
Green: Energy Consumption below 190KW/h  
Amber: Energy Consumption between 190KW/h & 240KW/h  
Red: Energy Consumption above 240KW/h

Total Days Tested: 23  
 Number of Days below 190KW/h: 12  
 Number of Days between 190KW/h & 240KW/h: 4  
 Number of Days above 240KW/h: 7



# PROGRESS AT FZUK.

- +34 units operating in Germany/France
- +120Km / Hr; 20tPayload; 400Km Range
- +Order Book – 157 Units
- +Fuelling Time – 5-10mins
- +St.Helens – Hynet – 1st for UK – Q3/4 2022
- +EV orders – 10 Orders
- +EV Demos – Merez/Scania/Renault/Lunaz & Elektra
- +Hydex - £5M – West Midlands Consortium
- +Dedicated Facility €15M Bremen – 500 Units
- +9 Dedicated EV chargers on Site (7kW – 11kW & 22kW)
- +10 EV cars & 4 Hybrid – Total Fleet Change - 2024
- +PIR Lighting.
- +Paperless Office
- +Reduction of Flights – Group Teams - £25K/month
- +Net Zero Comittee – Partnership with Planet Mark



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Thank you for your kind attention

QUESTIONS  
&  
OPEN DISCUSSION