



Hitachi Zosen Inova Bio-LNG

Hitachi Zosen  
INOVA

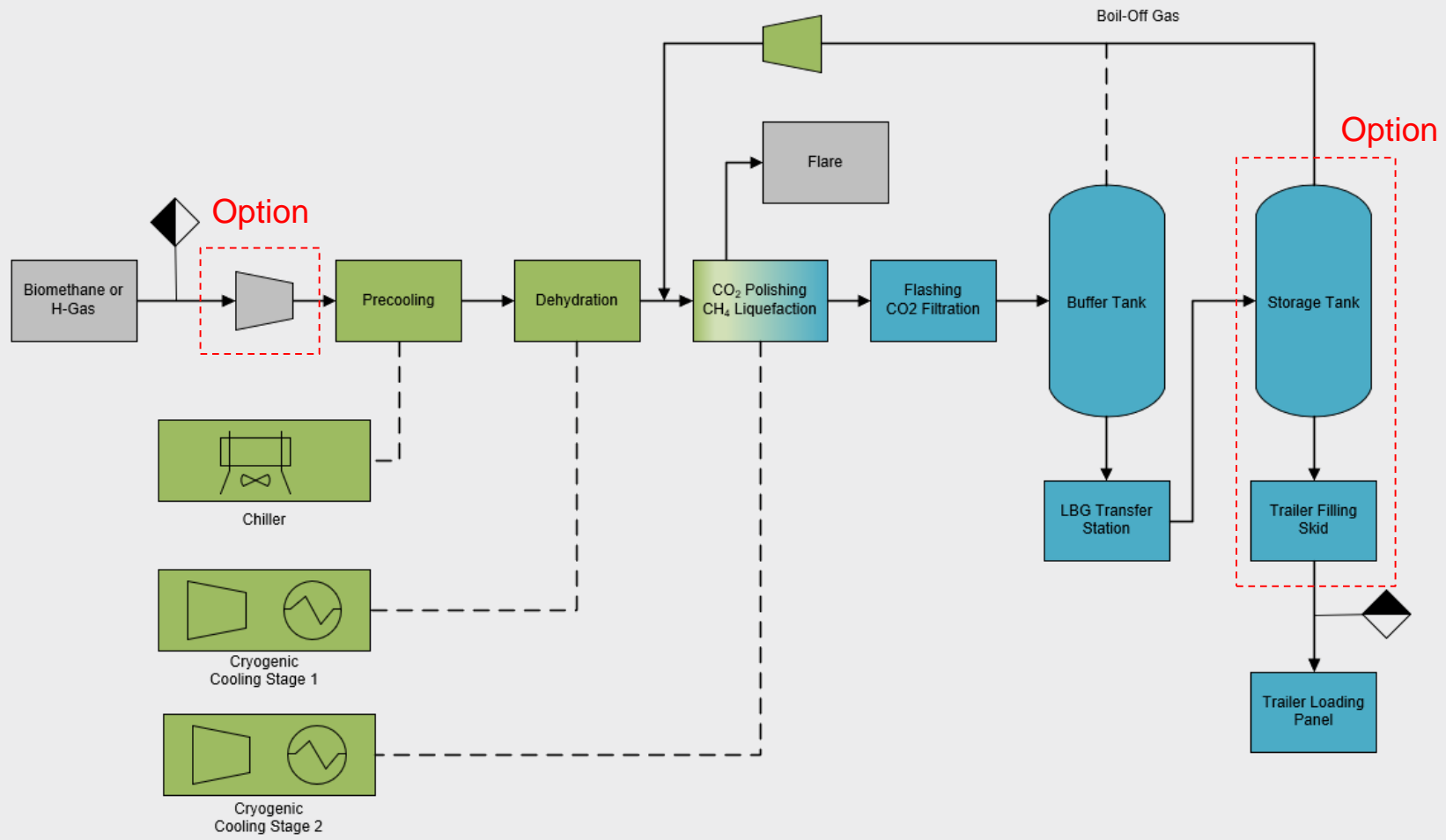


# Hitachi Zosen Bio-LNG Models & Key Figures

Type	Model XS	Model S	Model M	Model L	Model XL
Plant Input (Nm <sup>3</sup> <sub>BM</sub> /h)	Xx-300	160-380 (nom. 300)	200-500 (nom. 400)	300-700	700-XX
Plant Output (kg <sub>LBG</sub> /h)	90-150	125-290	165-390	235-550	500-1000
Footprint (L x B x H)	tbd	32 x 20 x 16 m		tbd	tbd
Design	tbd	3x40" Process Container 1x20" E-Container		5x40" Process Container 1x20" E-Container	tbd
Weight (t)	tbd	3x15 + 1x5		tbd	tbd
Ambient Temperature	tbd	-20 / +35 ° C		tbd	
Communication	tbd	Profinet		tbd	
Voltage	400 V / 3P	400 V / 3P		400 V / 3P	
Power Factor	≥ 0,95	≥ 0,95		≥ 0,95	
Energy consumption kWh <sub>e</sub> /kg <sub>LBG</sub>	< 1.0	< 1.0		< 1.0	
Nitrogen consumption (NI/h)	n/a	< 150		< 150	
Gas Quality	Biomethane	Natural Gas (H-Gas) Biomethane		Natural Gas (H-Gas)	
Liquefaction	Local	Via Grid Local		Via Grid	
Business Model	BOO & EPC	BOO		BOO	
Availability	95%	> 97%		95%	
Soundlevel @ 5 m	80 dB(A)	80 dB(A)		80 dB(A)	
PAC	NTP + 13 Months	NTP + 13 Months		NTP + 13 Months	



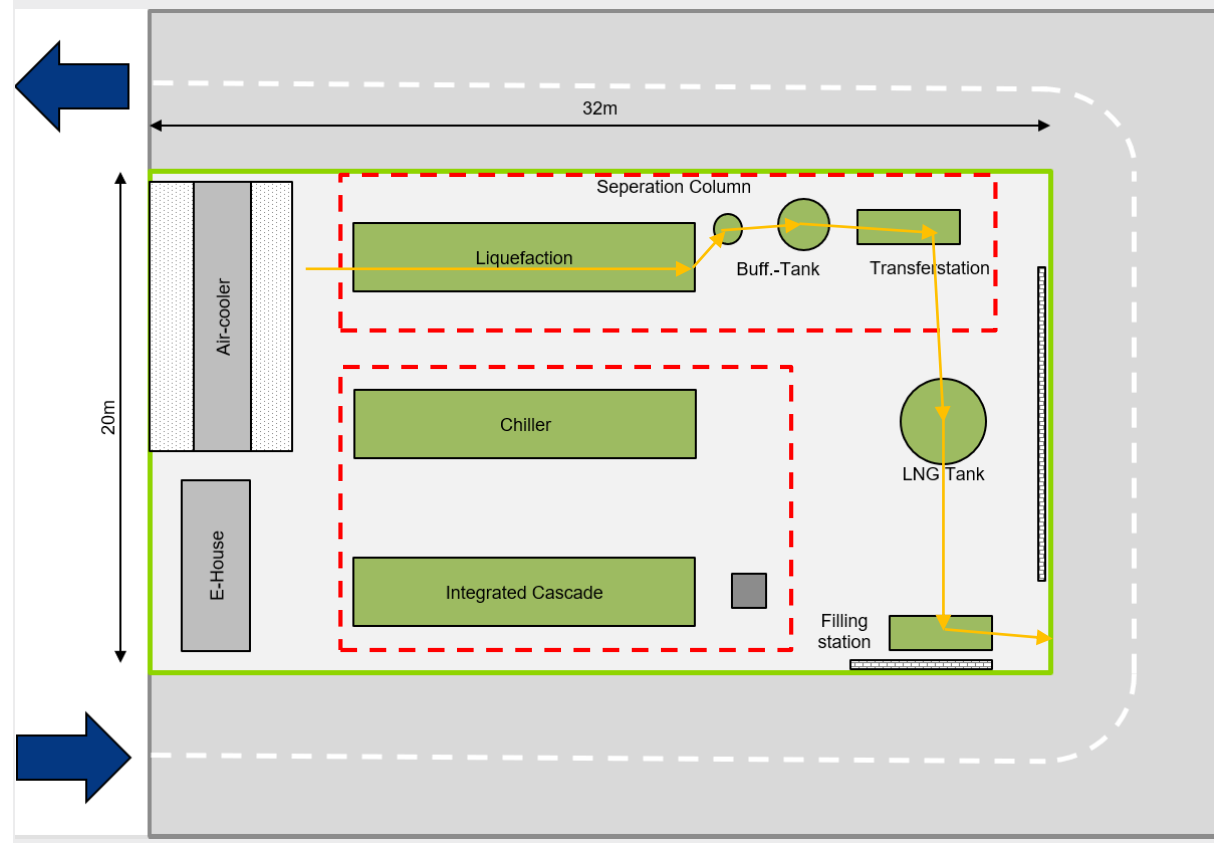
# Hitachi Zosen Bio-LNG Process Overview



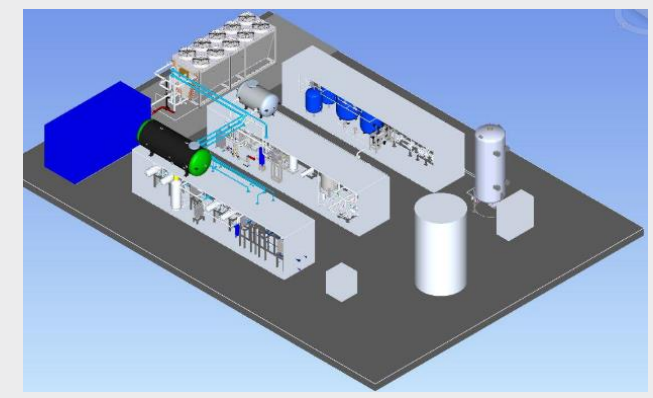




# Hitachi Zosen Bio-LNG Footprint

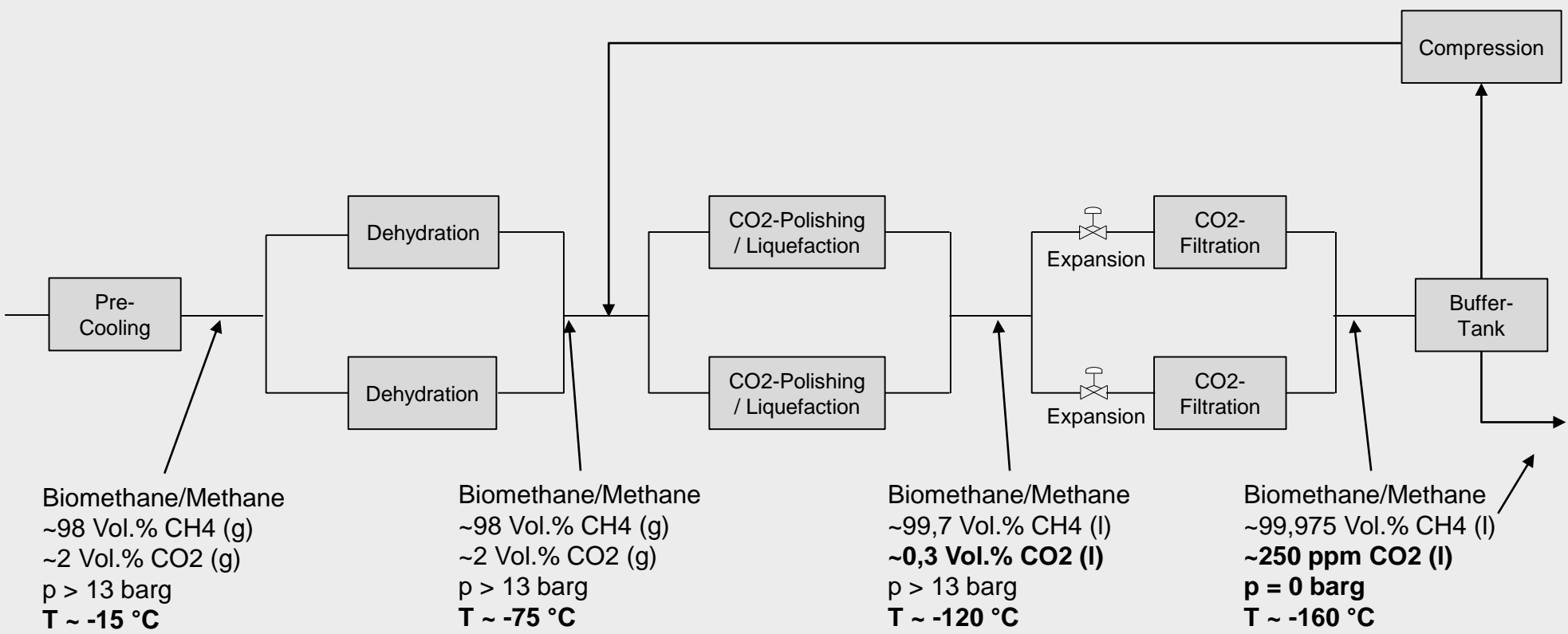


- 3x40 feet container for process equipment
- 1x20 feet container for electrical equipment
- Air Cooler (table design)
- Transferstation
- Storage Tank for 7 days (option)
- Fillingstation (option)





# Hitachi Zosen Bio-LNG Liquefaction Process





## Gas Quality (Input Specification)

Inlet	Input	-	Biomethane or Natural Gas
	Pressure		barg
Methane		Vol.%	> 90
Carbon dioxide		Vol.%	< 2
Nitrogen+Hydrogen		Vol.%	< 1
Hydrogen sulfide		ppm	0
C2		Vol.%	2 < C2 < 6
C3		Vol.%	0 < C3 < 2
C4		Vol.%	< 1
C5		Vol.%	< 0,3
C6		Vol.%	< 0,06
Gross Heating Value		kWh/Nm <sup>3</sup>	10,1 < H <sub>i</sub> < 13,1
Water content		mg/Nm <sup>3</sup>	< 50

## Bio-LNG Quality (Output Specification)

	Output	-	LBG or Bio-LNG
Outlet	LNG-Temperature	° C	$-162 < T < 150$
	LNG-Energy Content	kWh/kg <sub>LNG</sub>	$14,11 < H_i < 18,3$
	LNG-Pressure	barg	$0 < p < 10$
	Silicon	mg/kg	$< 0,4$
	Carbon dioxide	ppm	$\leq 250$
	Oxygen	Vol.%	$< 1$
	Hydrogen	Vol.%	$< 2$
	Total sulphur	mg/kg	$< 40$
	Methane Number	-	$> 65$
	Amines	mg/kg	$< 14$
	Solids	mg/l	$< 10$
	Particle size	µm	$< 10$
	Methane recovery	%	$> 99,5$