The largest recip-based power plants worldwide

The top ten by capacity

1. Aratu, Salvador, Brazil. 1056 MW

In the state of Bahia in eastern Brazil the region's many waterways are exploited for hydroelectric power on a GW scale. The area boasts two large dams – the 1050 MW Sobradinho power plant (on the Rio Sao Franciso) which is about 320 km long and at 4220 m^2 one of the largest reservoirs in the world, and the 465 MW Itapebi as well as several large dams on its borders and a host of medium sized and small run-of-river projects. In all it amounts to 2 GW, but significant variations in rainfall in recent years have necessitated the provision of support power, necessarily on a large scale.

The new plant is a 1000 MW+ project being built in the Aratu industrial complex near Salvador. It consists of 120 gensets powered by MAN 18V32/40 engines arranged in 6 units of 20 generating sets. Ground was broken in 2010 but the project is still under construction, 355 MW having been installed to date. (For basic details about the project see *MPS*, February 2011.)

2. IPP3, Jordan. 573 MW

In October 2012 a consortium of Wärtsilä and Lotte Engineering & Construction of South Korea signed a contract with Amman Asia Electric Power to supply a 573 MW IPP3 power plant to be located at Al Manakher, 30 km from Amman. The value of the EPC contract is USD 552 million, of which Wärtsilä's share is USD 334 million. The plant will consist of 38 Wärtsilä 50DF multi-fuel engines. A ground beaking ceremony was held in April 2012 year, and the first phase was scheduled to be in commercial operation by February 2013, with the entire plant completed towards the end of that year. When completed, it will be the world's largest tri-fuel power plant, capable of burning natural gas, heavy fuel oil and light fuel oil as its main fuels.

How IPP4 Jordon will look on completion in 2014

A 25 year Power Purchase Agreement with National Electric Power Company of Jordan (NEPCO) was signed in September 2012. Amman Asia Electric Power is owned by KEPCO, Mitsubishi and Wärtsilä.

3. Quisqueya I+II, Dominican Republic. 430 MW

The order for Quisqueya I, a 215 MW turnkey dual fuel plant intended primarily for natural gas firing, was placed by the Barrick Gold mining company in September 2011.

The €150 m contract for unit II, an identical facility to be located at the same site, was placed by Empresa Generadora de Electricidad Haina, the largest power generation company in the Republic, in December 2011. In each unit the 12 Wärtsilä 50DF generating sets run primarily on natural gas, but have the capability to switch to heavy fuel oil as needed. Both units were scheduled to be fully operational during the second half of 2013 to supply baseload electricity to the national grid.

The two power plants have separate owners, but are being constructed as a single unit, and can be operated from one control room. The combined I and II power plant complex was, in September 2011, the largest of its type ever ordered from Wärtsilä.

Suape II power plant

4. Boyuk Shor, Azerbaijan. 384 MW

In July 2012 Wärtsilä was awarded the contract to supply a complete gas fired power plant in Azerbaijan. In terms of output, it was the largest single power plant order that the company had received up to that time. On completion, the plant, which is located close to the capital Baku, will be operated by Azerenerji JSC, the state-owned utility.

Wärtsilä's will supply 21 x 50SG engines running on natural gas, related auxiliaries and process equipment. The plant was scheduled to be operational in autumn 2013, and will supply electricity to the Baku regional grid.

5. Suape II, Brazil. 380 MW

The 380 MW Suape II power plant, which is equipped with seventeen 20-cylinder Wärtsilä 46F engines in V-configuration, was in 2012 the biggest plant built and completed by Wärtsilä. It was inaugurated at the end of December 2011. As an intermediate load plant, it will feed electricity to the national grid to balance the supply of hydro power. Hydro power accounts for some 90 % of Brazil's electricity production, but is subject to fluctuations due to seasonal rainfall levels.

Wärtsilä signed a 3 year O&M contract, and its team will be permanently on site to operate and maintain the power plant.

6. Geramar I+II. 332 MW

The 331MW Geramar power plant is located in Miranda do Norte, a city of 15000 habitants in Maranhão, Brazil. The order was placed by Geradora de Energia do Maranhão, a consortium created by Grupo Servtec, Grupo Ligna, FIP Brasil Energia and Equatorial Energia S.A. Servtec and FIP, with the plant coming on line in 2010. Brasil Energia are also major stakeholders in other Wärtsilä installations in Brazil.

The contract called for a full EPC project consisting of two units, each with 19 Wärtsilä 20V32 engines, for the combined output of 331 MW. The engines burn heavy fuel oil of high viscosity and low sulphur content.

7. Sangachal, Azerbaijan. 298.8 MW

The contract was awarded to Wärtsilä by Azerenerji OJSC (State Electric Company of Azerbaijan), in December 2006, for power plant desgin and supply, and other principal equipment and all building materials, as well as undertaking supervision of the building and equipment installation.

Originally scheduled for completion in 2008, the plant reached full production on 24 December 2012 when Wärtsilä and ABB finished commissioning the plant.

The station consists of 18 x 50DF modular generators each of 16.6 MW capacity. The engines can run on heavy or light fuel oil, or natural gas.

8. Coloane A, China, 271.4 MW

The Coloane A power station is a diesel-fired power station in Macau, China and is the largest power station in the region. Its installed capacity makes up 58% of Macau's total. In 2012, it generated 98% of total electricity production in Macau. It is a combined cycle unit consisting of six Mitsui MAN Diesel & Turbo diesel engines (2 x 9K80MC-S (24 MW), 2 x 12K80MC-S (37.4 MW) and 2 x 12K90MC (51.5 MW), and two 20 MW Peter Brotherhood steam turbines. First operation was in 1987, with new engines added in stages until 1996.

9. Aliaga Alosbi I+II, Turkey. 270.6 MW

This combined cycle facility operated by Aliaga Çakmaktepe Enerj Üretim has reached its total of 270.6 MW in stages, in two main phases. For both phases the supplier was Wärtsilä. The first configuration consisted of 4 x 17MW 18V46 HFO engines in CHP mode, coming on line in 2007. Output was and is primarily for the Organize Sanayi Bölgesi (ALOSBI) industrial zone about 65 km from Izmir city.

The second phase was opened on 29 September 2010 as the largest gas engine power station in the world, with 28 x 8.7 MW 20V34SG units fired by natural gas and 2 x 13.5 MW steam sets, also in CHP mode. Six engines came online with the balance to follow when the required transmission links were completed.

10. Pavana III, Honduras. 267.2 MW

This oil fired facility came on line in 2004. It is operated by Luz y Fuerza de San Lorenzo SA. The project originated with Empresa Nacional de Energía Eléctrica's 2001 tender for 210 MW for 12 years. In November 2002, ENEE awarded the PPA to Lufussa, and in January 2005 the plant was officially inagurated – 12 months ahead of schedule – by Honduran president Ricardo Maduro. It was Wärtsilä's largest project to that date and cost $190 million. Pavana III was one of the first installations equipped with a condition-based maintenance (CBM) system connected online to Wartsila's CBM centre in Vaasa, Finland. MPS

Facilities of 80 MW or more, operating or under construction

Name	Location	Capacity MW	Fuel	Year[1]	Configuration	E/G supplier
Aratu, Salvador	Brazil	1056	Diesel	U/C	120 x 18V32/40 in 6 units	MAN Diesel & Turbo
IPP3	Jordon	573	Tri-fuel	2014	38 x 50DF	Wärtsilä
Quisqueya I+II	Dominican Republic	430	HFO, nat gas	2013	12 x 18V50DF + 12 x 18V50DF	Wärtsilä
Boyuk Shor	Azerbaijan	384	Nat gas	2013	21 x SG	Wärtsilä
Suape II	Brazil	382.5	HFO	2011	17 x 46F	Wärtsilä
Geramar I+II	Brazil	331.8	HFO	2010	38 x 20V32	Wärtsilä
Sangachal	Baku, Azerbaijan	306.8	FO, nat gas	2012	18 x 16.6 MW 50DF	Wärtsilä
Coloane, Macau	China	271.4 CC	HFO, diesel	1978-97	2x24, 2x38.6, 2x53.1, +2x20 ST	MAN D&T, Pter Brotherhood
Aliaga Alosbi-II[2]	Izmir, Turkey	270.6 CC	HFO, nat gas	2007	4 x 18V46, 28 x 20V34SG, 2 x 13.5 MW steam	Wärtsilä
Pavana III	Honduras	267.2	Oil	2004	16 x 18V46	Wärtsilä
Kiisa ERPP 1 & II	Estonia	250	Nat gas, LFO	2013-4	27 x W20V34DF	Wärtsilä
Choloma	Honduras	250	HFO	2004-5	14 x 18V48/60	MAN Diesel & Turbo
IPP4	Jordan	240	HFO, DFO, gas	2014	16 x 50DF	Wärtsilä
Bauang La Union	Philippines	241.5	HFO	1994	21 x 16ZA40S	Sulzer, Alstom
Plains End, Colorado[3]	USA	231	Nat gas	2002, 2006	20xW18V34SG, 14xW20V34SG	Wärtsilä
STEC Red Gate, Texas	USA	225	Nat gas	2014	12 x 50SG	Wärtsilä
Port-Est	Reunion	222	HFO	2010	12 x 18V48/60	MAN Diesel & Turbo
Port Westward Unit 2, Oregon	USA	220	Nat gas	2015	12 x 50SG	Wartsila
Atlas	Pakistan	220	Furnace oil	2009	11 x 18V48/60	MAN Diesel & Turbo
Kribi	Cameroon	216	Nat gas/LFO	2013		Wärtsilä
Pearsall, Texas	USA	202.5	Nat gas	2010	24 x 20V34SG	Wärtsilä
Linhares	Brazil	204	Nat gas	2010	24 x 20V34SG	Wärtsilä
Pesangarran, Bali	Indonesia	200	Nat gas, HFO	2014-5	12 x 50DF	Wärtsilä
Nishat	Pakistan	200	HFO	2010	11 x 18V46	Wärtsilä
Nishat Chunian	Pakistan	200	HFO	2010	11 x 18V46	Wärtsilä
Vasavi	India	200	HFO	1998	4 x 12K90MC-S	MAN D&T, Hyundai, ABB
Liberty Power Tech	Pakistan	200 CC	HFO	2010	11 x 18V46, CC plant (1xST)	Wärtsilä
Sasolburg	South Africa	175	Nat gas	2012	18 x W20V34SG	Wärtsilä
Viana	Brazil	175	HFO	2009	20 x 20V32	Wärtsilä
La Paz (Baja California Sur)	Mexico	173	Diesel oil	2005-13	4 units, CC plant	Man Diesel & Turbo
Eklutna, Arkansas	USA	171	Nat gas, LFO	2014	10 x W18V50DF	Wärtsilä
Ceará	Brazil	168	HFO	2010	8 x 20V46F	Wärtsilä
Clifton Pier	Bahamas	165	HFO	1963	1 x 6 MW, 4 x 10 MW, 2 x 26.5 MW, 2 x 33 MW	Sulzer, MAN Diesel & Turbo
Campina Grande	Brazil	164	HFO	2010	20 x 20V32	Wärtsilä
King Salmon	California	163	Nat gas, diesel	2010	10 x 18V50DF	Wärtsilä
Cntrl Termica Ressano Garcia	Mozambique	162	Nat gas	2014	18 x 34SG	Wärtsilä
Planta Arizona	Guatemala	160	HFO, LFO	2003	10 x 18V46	Wärtsilä
Sapugaskanda	Sri Lanka	160	HFO	1984	16 x 10 MW	SEMT, MAN D&T, Siemens
Attock	Pakistan	160	HFO	2008	9 x 18V46	Wärtsilä

Facilities of 80 MW or more, operating or under construction

Name	Location	Capacity MW	Fuel	Year[1]	Configuration	E/G supplier
Bangkanai	Indonesia	155	Nat gas	2014	16 x 34SG	Wärtsilä
Samsun I	Turkey	150	HFO, nat gas	2003	18V46s + 1x18V50SG, CC, CHP	Wärtsilä
Aracruz	Brazil	150	Diesel oil	2013	17x18V32/40	MAN Diesel & Turbo
Breitener	Brazil	150			8x18V48/60, 2x16V32/40	MAN Diesel & Turbo
Jaramijo	Ecuador	149	HFO	U/C	16 x 18H32/40V	Hyundai
Muricy	Brazil	148	Diesel oil	2008	8x18V48/60	MAN Diesel & Turbo
Arembepe	Brazil	148	HFO	2008		Hyundai
Yesilyurt	Turkey	145	Nat gas	2012	8 x 50SG	Wärtsilä
Nejapa	El Salvador	143.9	HFO, diesel	1995	27 x 18V32	Wärtsilä, ABB
Ralwind JPGL, Lahore	Pakistan	135.6	HFO	2000	24x18KU30A	MHI, Melco
Odas	Turkey	135	Nat gas	2011	7 x 18V50SG	Wärtsilä
Betano, East Timor	D. R. Timor-Leste	135	HFO. nat gas	2012	8 x 18V46	Wärtsilä
Samsun II	Turkey	132	HFO	2003	18V46s, CC, CHP	Wärtsilä
Somelec	Mauritania	129	HFO/LFO/gas	2015	8 x 50DF	Wärtsilä
Emile Martin	Tahiti	124	HFO	'86-2009	4x14MW 12PC4, 4x17MW 18V46	SEMT, Alstom, Wärtsilä
Hera, East Timor	D. R. Timor-Leste	118.3	HFO. nat gas	2012	7 x 18V46	Wärtsilä
Raiwind Sepcol	Pakistan	117	HFO	1999	5x18PC4.2V570B	SEMT, ABB
Kipevu III	Kenya	116.9	HFO	2010	7 x 18V46	Wärtsilä
Goldstrike, Nevada	USA	116.2	Nat gas	2005	14x120V34SG	Wärtsilä
Antelope Station, Texas	USA	114.1	Nat gas	2011	18 x 34SG	Wärtsilä
PLTMG Duri	Indonesia	113	Nat gas, LFO	2013	7 x 50DF	Wärtsilä
Spring Gardens	Barbados	112	Diesel	1982-9	4x12L55GS-CA, 2x980MC-S	MAN Diesel & Turbo
Tikhvin	Russia	110	Nat gas	2014	6 x 50SG	Wärtsilä
Sei Gelam	Indonesia	110	Nat gas	2012	11 x 34SG	Wärtsilä
Baku 3	Azerbaijan	108	Nat gas	2007	12 x20V34SG	Wärtsilä
Quevedo	Ecuador	106.8	Diesel	2011		Hyundai
Olachea	Mexico	106	HFO	1991	2x12RTA76, 1x 42MW 12K90MC-S	MHI, Hyundai, MAN D&T, ABB
Los Negros Azua	Dominican Republic	105.3	LFO, HFO	2003	3x9CM43	Caterpillar
EPS	Bermuda	104	HFO	1985	2x12.5 MW 8K67GSCA, 2x10.5 MW 16ZA40S, 4x14.5MW 14V48/60	MAN D&T, Sulzer, Zgoda, GEC
Tamaya	Chile	104	Diesel	2009	10x10.4 MW	Sulzer
Kalecik	Cyprus	102.5	HFO	2003	CC. 6x18V46, 15 MW steam set	Wartsila, ABB, Dresser
Atherinolakkos	Crete	102	HFO	2004	2x12K90M-C	Mitsui, MAN D&T
Pomalaa Extension	Indonesia	102	HFO	2004	6x18V46	Wärtsilä
Yue Yan	China	100.8	HFO, LFO	2002	12x18V32LN, 3x18V32, CHP	Wärtsilä
Meghnaghat Orion, Dhaka	Bangladesh	102	HFO, diesel	2011	12 x 20V32	Wärtsilä
Lomo Countour	Togo	100.2	HFO, LFO	2010	6x50DF	Wärtsilä
Gopalganj	Bangla Desh	100	HFO	2011		
Mutiara Jamalpur	Bangladesh	100	HFO/Nat gas	2012	17 x 6MW engines	Wärtsilä
Lafarge	Nigeria	100	Nat gas	2011	6 x 18V50DF	Wärtsilä
Tanesco	Tanzania	100	Nat gas	2007		Wärtsilä
Embilipitiya	Sri Lanka	99.54	HFO	2005	14 x 16CM32C	Caterpillar
Acajutia Phase 1	El Salvador	99	HFO	2000	6 x 18V46	Wärtsilä
Arkay	India	95.1 CC	Nat gas	2006	CC, 10x20V34SG, 1 x 8.1 MW steam	Wärtsilä, Hangzhou
Thika	Kenya	94.8 CC	HFO	2013	4 x 18V48/60, 1 x 6.8 MW ST	MAN Diesel & Turbo
Santa Elena	Ecuador	94.34	Diesel oil	2011	53 x 9H21/32	Hyundai
Piti	Guam	92.1	HFO	1999	2 x 10K90MC-S, 1 x 2.1 MW	MAN Diesel & Turbo
Panay	Philippines	92	Diesel oil	1999-2004	6 x 16ZA40S, +2 x 10 MW	Sulzer Asia
Komipo	South Korea	91			2 x 12K80MC-S	MAN Diesel & Turbo
Khachmaz	Azerbaijan	90	N gas	2006	10 x 20V34SG	Wärtsilä
Fort George	Mauritius	90	Diesel	1997-2000	3 x 9K80MC-S	MAN Diesel & Turbo
Hirgigo	Eritrea	90	HFO	1998	4 x 12K60MCS	MAN Diesel & Turbo, HSD
La Vega	Dominican Republic	87.5	HFO, LFO	2000	5 x V48/60	MAN Diesel & Turbo
Tablas	Philippines	86.4	Diesel oil	1983-2008	12 x 7.2 MW, various	MAN, Perkins, FG Wilson
Yassa Dibamba	Cameroon	86	HFO	2009	8 x 18V38	Wärtsilä
Limbe	Cameroon	85.5	HFO	2004	5 x 18V46	Wärtsilä
Cristiano Rocha	Brazil	85.4	HFO	2006	5 x 18V46	Wärtsilä
Haralbeke	Belgium	85.35	Oil, palm oil	1976	7 x 14V52/55, 1 x 13.25MW 18V52/55	MAN Diesel & Turbo, ACEC

Facilities of 80 MW or more, operating or under construction

Name	Location	Capacity MW	Fuel	Year[1]	Configuration	
Eden Yuturi	Ecuador	85	Gas, crude oil	2002-2012	4x18V32GD, 3x18V34SG, 6x18V32	Wärtsilä
Asmara	Eritrea	84			4 x 12K60MC-S	MAN Diesel & Turbo
Manisa	Turkey	83.9	Diesel, HFO, Nat gas	2005	3x18V50DF, 4x20V34SG CHP	Wärtsilä
Gera	Brazil	83	HFO	2006	5x18V46	Wärtsilä
Fort Victoria[4]	Mauritius	80	Oil	1974	7x6 MW, 2x9 MW, 2x10 MW	Mirrlees, MAN D&T, Wartsila, Brush
Hybrid plants						
Miraflores	Panama	151	HFO, diesel	1962	Steam and gas turbines	WH, Hitachi, MAN D&T
Punta Grande	Las Palmas	140	LFO, HFO	1986-2006	ICE and GTs	Sulzer, MAN D&T, Alstom
Los Guinchos	Tenerife, Spain	80	HFO, diesel	1967	80 MW ICEs+15 MW GT	MAN Diesel & Turbo
Power ships and barges of 50 MW and over						
Kaya Bey[5]	Karachi	232	HFO	2011	19 diesel gensets	Sulzer and Wärtsilä
Sultana del Este	Dominican Republic	148.5	HFO	2002	9 x 18V46	Wärtsilä
PQP Power Barge	Guatemala	125			7 x 18V48/60	MAN Diesel & Turbo
Haripur barge	Bangladesh	120	HFO/Nat gas	1999	8 x 18V46GD	Wärtsilä
Tiger Barge	Bangladesh	110.4	Nat gas, HFO	1998	19x18V32LN	Wärtsilä
Power Barge 117	Guimaras, Philippines	103.5	Oil	1994	2x12K90MC-S (CC, 3.5 MW steam)	MAN D&T, ABB, Shinko, Meidensha
Power Barge 118	Maco, Philippines	100			2x12K90MC-S	MAN Diesel & Turbo
Dr Bird I	Jamaica	76	HFO	1995	8x12V46	Wärtsilä
Corinto	Nicaragua	70.4	HFO	1999	4x18V48/60	MAN D&T, Siemens
Colombo Barge	Sri Lanka	60	HFO	2000	4x12K50MC-S	Mitsui MAN Diesel & Turbo
Dogan Bey	Iraq	60	HFO	2010	4x15 MW	Wärtsilä
CELEC Barge	Ecuador	50	HFO	2009	4 x 52/55	MAN Diesel & Turbo
Dr Bird II	Jamaica	50	HFO	2006	3x18V46	Wärtsilä, ABB

Notes : 1. 'Year' refers to date, or spread of dates on multi-unit sites, of actual or scheduled first commercial operation. 'U/C' means that date is unknown. 2. CC plant. Largest gas fired ICE plant in the world in 2010. 3. At the time of completion in 2002 it was the largest in N America. 4. Phase II - 60 MW – was due to be added in 2012. 5. Largest power ship in existence at present time.