

Supplementary materials:

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Table S1: Metrics for large scale hydropower plants.

LARGE SCALE HYDROPOWER										
Plant	Capacity (MW)	Maximum flow (m3/s)	Annual production (Mwh)	Hydraulic Pumping Capacity	Reservoir	Reservoir capacity (hm3)	Reservoir surface (m2)	Lenth of river stretch (m)	Water withdrawal (m3)	Evaporation (m3)
Agavanzal	24.09	60.00	52,210.00	NO	Agavanzal	35.90	3,650,000.00	17,446.00	468,115,063.72	3,034,000
Aguilar de Campoo	10.23	24	20,600.00	NO	Aguilar de Campoo	247.23	16,460,000.00	15,000	173,982,404.69	7,440,000
Aldeávila I	855.00	625.80	2,480,700.00	NO	Aldeávila	114.87	4,060,000.00	42,287	6,536,513,936.84	4,330,000
Aldeávila II	408.00	340.00	195,000.00	YES	Aldeávila	-----	-----	1,000.00	585,000,000.00	-----
Camporredondo	14.77	22.00	26,698.12	NO	Camporredondo	69.79	4,052,000.00	15,038	143,141,807.96	1,290,000
Castro I	87.58	270.00	221,156.40	NO	Castro	27.50	1,573,000.00	25,558.00	2,454,375,465.84	1,860,000
Castro II	120.20	340.00	300,000.00	NO	Castro	-----	-----	900.00	3,054,908,485.86	-----
Cernadilla	30.00	60.00	55,900.00	NO	Cernadilla	255.54	13,419,000.00	39,411.00	402,480,000.00	8,424,000
Compuerto	20.00	24.00	51,700.00	NO	Compuerto	95.00	3,807,300.00	21,514.00	223,344,000.00	1,160,000
La Remolina	85.00	106.00	97,630.00	NO	Riaño	651.14	20,679,000.00	42,600.00	438,301,270.59	6,940,000
Moncabril	35.96	8.00	91,320.44	NO	Porto & Playa	25.88	2,766,000.00	17,187.00	73,137,612.01	1,515,768
Porma	16.60	30.00	62,800.00	NO	Porma	317.83	11,825,200.00	29,245.00	408,578,313.25	6,940,000
Ricobayo I	183.30	240.00	684,000.00	NO	Ricobayo	1,178.88	59,179,900.00	164,775.00	3,224,091,653.03	31,890,000
Ricobayo II	135.00	210.00	130,000.00	NO	Ricobayo	-----	-----	329.00	728,000,000.00	-----
San Isidoro	38.40	40.80	62,100.30	NO	Barrios de Luna	308.00	11,300,000.00	40,000.00	237,533,647.50	5,240,000
Santa Teresa	19.88	50.00	69,950.00	NO	Santa Teresa	496.00	26,239,200.00	37,360.00	633,350,100.60	16,240,000
Saucelle I	285.00	475.20	600,000.00	NO	Saucelle	181.37	6,031,000.00	31,935.00	3,601,515,789.47	7,340,000
Saucelle II	252.00	523.00	488,000.00	NO	Saucelle	-----	-----	1,501.00	3,646,057,142.86	-----
Valparaíso	60.00	158.00	60,000.00	YES	Valparaíso	162.37	12,559,000.00	49,180.00	568,800,000.00	10,354,000
Villalba	12.60	17.00	52,000.00	NO	Velilla de Guardo	1.81	290,000.00	14,440.00	252,571,428.57	204,000
Villalcampo I	96.00	303.00	119,520.00	NO	Villalcampo	66.00	2,253,000.00	22,400	1,358,046,000.00	4,140,000
Villalcampo II	110.00	340.00	137,000.00	NO	Villalcampo	-----	-----	573	1,524,436,363.64	-----
Villarino-Almendra	829.75	232.50	1,930,000.00	YES	Almendra	2,586.34	84,615,300.00	122,600.00	1,946,863,513.11	50,520,000
TOTAL	3,729.37	4,499.30	7,988,285.25			6,821.46	284,758,900.00	752,279.00	32,683,143,999.54	168,861,768

Table S2: Metrics for small scale hydropower plants

SMALL SCALE HYDROPOWER											
Plant	Type	Capacity (kW)	Maximum flow (m3/s)	Annual production (kwh)	Hydraulic Pumping Capacity	Reservoir	Reservoir capacity (hm3)	Reservoir surface (m2)	Lenth of river stretch (m)	Water withdrawal (m3)	Evaporation (m3)
Acera de la Vega	Canal	8,670	17	34,200,000	NO	Small dam	1.80	290,000	11,350	241,411,764.71	177,190
Agueda	RHP	4,980	20	9,840,000	NO	Agueda Reservoir	22	1,770,000	13,333	142,265,060.24	1,610,000
Aguilarejo	RoR	1618	60	5,693,267	NO	weir	-----	-----	33.28	760,040,588.38	
Alar	RoR	406	20	1,642,871	NO	weir	-----	-----	370	291,346,581.28	
Alcoba de la Ribera o Alcoba	canal	9,600	38	23,190,000	NO	weir	-----	-----	9,400	330,457,500.00	
Alcozar	RoR	4480	30	2,826,068	NO	weir	-----	-----	150	68,128,425.00	
Almenara	RoR	402	14	1,620,041	NO	Small dam	-----	14,300	528	195,855,702.99	5,220
Ambasaguas de Curueño	RoR	1,990	9	5,969,643	NO	weir	-----	-----	4436	99,354,058.37	
Aranda I	RoR	184	8	2,848,679	NO	weir	-----	-----	115	445,880,191.30	
Aranda II	RoR	500	20	2,465,657	NO	weir	-----	-----	107	355,054,608.00	
Arlanzón	RHP	1,200	4	4,463,000	NO	Arlanzón Reservoir	23.38	1,274,400	2,366	53,556,000.00	660,000
Arroyo de Los Pozos	RoR	1,074	0	706,692	NO	weir	-----	-----	1,384	592,200.00	
Ausín o Molino de Ausín	RoR	1,882	60	5,455,394	NO	weir	-----	-----	266	626,123,859.72	
Barrios de Luna	RHP	400	1	2,515,200.00	NO	Barrios de Luna Reservoir	0.31	11,300,000	17460	11,318,400.00	5,240,000
Bocos	RoR	1438	30	3,517,436	NO	weir	-----	-----	50	264,174,609.18	
Boñar I o Boñar	RoR	2,434	18	12,290,000	NO	weir	-----	-----	3,650	327,194,741.17	
Bubones	RoR	1468	20	3,209,352	NO	weir	-----	-----	2,000	157,406,910.08	
Burgomillodo	RHP	3233	9	3,588,586	NO	Burgomillodo Reservoir	15.00	940,000	9569	36,562,951.70	930,000
Camposolillo	RoR	1,700	10	2,507,328	NO	weir	-----	-----	1,369	53,096,357.65	
Canal de Almazán	RoR	1,576	14	1,822,436	NO	weir	-----	-----	79	58,280,948.22	
Casares	RoR	1,970	3	2,920,000	NO	Casares Reservoir	37.00	2,800,000	3,010	16,008,121.83	1,770,000
Castro de Las Cogotas o Las Cogotas	RHP	5,251	10	13,800,000	NO	Las Cogotas Reservoir	58.60	4,000,000	8,630	94,610,550.37	2,362,000
Cimanes del Tejar o Cimanes	canal	9,600	38	25,560,000.00	NO	weir	-----	-----	9,600	364,230,000.00	
Cubo de Don Sancho	RoR	49	20	65,817	NO	Small dam	-----	35,000	300	96,710,693.88	
Cuerda del Pozo	RHP	6,035.20	21	8,500,000	NO	Cuerda del Pozo Reservoir	229.00	21,760,000	21,760	103,940,217.39	11,000,000
El Chorro	RoR	1,024	1	4,230,000	NO	El Duque Reservoir	2.50	270,000	1,846	13,383,984.38	117,180
El Cabildo	RoR	606	27	1,867,624	NO	weir	-----	-----	180	296,408,570.99	
El Cardiel	RoR	260	6	782,457	NO	weir	-----	-----	470	65,004,120.00	
El Hoyo	RoR	3,582	105	5,867,695	NO	weir	-----	-----	1,410	619,203,994.97	
El Martinete	RoR	639	4	758,493	NO	weir	-----	-----	682	17,092,800.00	
El Pisón	RoR	75	3	94,114	NO	weir	-----	-----	377	11,438,239.10	
El Tejado	RoR	662	24	2,517,349	NO	weir	-----	-----	295	328,548,268.28	
El Vergueral	RoR	515	20	42,224,080	NO	weir	-----	-----	450	5,903,172,349.51	
Esclusa 14 Canal Castilla o Esclusa 14	canal	237	8	950,000	NO	canal	-----	-----	124	112,556,962.03	
Esclusa 38	canal	60	2	400,396	NO	canal	-----	-----	76	47,567,044.80	
Esclusa cuatro o La Cuarta	canal	70	1	441,396	NO	canal	-----	-----	76	22,700,365.71	
Espinosa de la Ribera o Espinosa	canal	9,780	38	16,325,378	NO	weir	-----	-----	7,000	228,354,975.48	
Ferreras	RoR	2,434	4	10,400,000	NO	Transfer	-----	-----	30,000	61,528,348.40	
Frómista (Esclusa 17, 18, 19 y 20)	canal	789	2	2,367,000	NO	canal	-----	-----	306	21,600,000.00	
Fuentermosa o Fuentehermosa	RoR	348	1	1,008,667	NO	weir	-----	-----	600	13,043,107.76	
Garrido	RoR	128	2	66,167	NO	Bodón de la Ibiensa Reservoir	Rep.	Rep.	400	3,766,556.48	
Gormaz	RoR	415	18	608,096	NO	weir	-----	-----	500	94,950,893.49	
Guma	RoR	2,295	35	7200000	NO	Small dam	0.89	188,050	3,000	395,294,117.65	85,187

Herreros	RoR	1,208	101	7,049,200	NO	weir	-----	-----	270	2,119,661,761.59	
Husillos	RoR	329	15	924,000	NO	weir	-----	-----	550	151,659,574.47	
La Aurora	RoR	656	25	1,284,904	NO	weir	-----	-----	331	176,282,560.98	
La Conchita	RoR	848	36	2,229,852	NO	weir	-----	-----	97	340,788,701.89	
La Confianza	RoR	640	6	796,004	NO	Small dam	12.40	4,380	284	26,865,135.00	1,353
La Flecha	RoR	984	85	8,045,099	NO	Small dam	-----	20,140	55	2,501,829,567.07	5,518
La Gila	RoR	76	3	456,000	NO	weir	-----	-----	49	64,238,400.00	
La Güera	RoR	132	4	224,462	NO	weir	-----	-----	223	24,486,763.64	
La Higuera	RoR	580	17	1,445,051	NO	weir	-----	-----	337	152,477,795.17	
La Isla	RoR	1,884	118	7,748,222	NO	weir	-----	-----	252	1,747,791,605.92	
La Josefina	RoR	1,112	36	2,920,119	NO	weir	-----	-----	447	340,330,415.83	
La Lera	RoR	408	15	1,581,679	NO	weir	-----	-----	1,087	209,339,867.65	
La Pelotera	RoR	246	0	746,300	NO	weir	-----	-----	758	40,955.49	
La Peña o Villahoz	RoR	432	11	1,173,200	NO	weir	-----	-----	200	111,454,000.00	
La Pola de Gordón	RoR	425	11	704,822	NO	weir	-----	-----	172	64,478,774.96	
La Rachela	RoR	290	4	930,900	NO	weir	-----	-----	625.6	46,224,000.00	
La Recorba	RoR	432	12	25,415.65	NO	Small dam	-----	200	40	2,541,565.00	86
La Requejada	RHP	4,217	10	13,621,339	NO	La Requejada Reservoir	66.42	3,330,000	9,360	118,609,335.57	1,350,000
La Ventosa	RoR	110	7	0	NO	weir	-----	-----	829	34,821,818.00	
La Villa o Salto de la Villa	RoR	421	8	1,139,909	NO	weir	-----	-----	800	77,979,523.04	
Las Arenillas o Fuenrosario	RoR	76	4	547,500	NO	weir	-----	-----	121	114,110,526.32	
Las Once Paradas	RoR	224	9	600,423	NO	weir	-----	-----	583	82,022,070.54	
Las Sorribas	RoR	208	8	5,600,000	NO	weir	-----	-----	5,500	38,304,000.00	
Las Vencías	RHP	2,400	15	1,840,335	NO	Las vencías reservoir	9.00	580,000	5,200	41,407,537.50	610,000
Ligüézana	RoR	500	12	1,780,070	NO	weir	-----	-----	168	153,798,048.00	
Linares del Arroyo	RHP	1,604	7	2,450,000	NO	Linares del Arroyo Reservoir	54.55	4,700,000	9,900	38,491,271.82	3,830,000
Los Cotriles	RoR	306	5	1,779,696	NO	weir	-----	-----	607	94,219,200.00	
Los Leones o Puente de los Leones	RoR	674	20	1,186,384	NO	weir	-----	-----	10	126,735,382.79	
Los Molinos del Soto o Los Molinos	RoR	733	9	4,300,000	NO	weir	-----	-----	1,000	185,844,474.76	
Los Rábanos	RHP	4,480	30	4,800,435	NO	Los Rábanos Reservoir	6.40	920,000	6,836	115,724,772.32	750,000
Lubián I o Salto de Lubián	RoR	1,070	3	2,025,860	NO	canal	-----	-----	1,464	20,938,683.10	
Lugán	RoR	846	5	2,951,173	NO	weir	-----	-----	3,050	62,790,914.89	
Maire	RoR	430	12	1,696,390	NO	weir	-----	-----	3,565	170,428,018.60	
Matallana de Torio o Torio I	RoR	1,520	12	2,680,845	NO	Small dam	0.50	-----	1,233	76,192,436.84	
Matazorita	RoR	210	6	1,256,059	NO	weir	-----	-----	1,233	129,194,640.00	
Molinaferrera	RoR	1,244	1	2,043,174	NO	weir	-----	-----	1,100	7,390,902.73	
Molino de Andrés	RoR	3,750	22	4,046,280	NO	Small dam	0.84	114,200	56	85,457,433.60	62,239
Molino de Getino	RoR	107	4	332,388	NO	weir	-----	-----	67	44,732,590.65	
Molino de Las Huertas	RoR	330	20	1,221,935	NO	weir	-----	-----	932	266,604,000.00	
Molino del Batán o Los Batanes	RoR	220	3	269,459	NO	weir	-----	-----	156	13,227,987.27	
Molino del Puente	RoR	404	20	1,453,139	NO	weir	-----	-----	510	258,975,267.33	
Molino El Berral o El Berral	RoR	148	2	239,710	NO	weir	-----	-----	806.8	9,399,223.46	
Molino Rica Posada	RoR	8	1	24,000	NO	weir	-----	-----	273	5,918,400.00	
Molino San Andrés	RoR	33	1	111,355	NO	weir	-----	-----	2942	10,896,592.91	
Molinos de Castilla	RoR	1,872	32	4,997,734	NO	weir	-----	-----	172	309,378,956.65	
Monasterio	RoR	1,366	40	3,240,110	NO	weir	-----	-----	20	341,563,572.47	
Morla	RoR	188	2	575,612	NO	small dam	-----	9,600	2,000	22,044,714.89	4,147
Navapalos	RoR	542	20	2,244,958	NO	small dam	-----	37,000	507.5	298,223,202.95	17,797
Nuestra Señora de las Mercedes	RoR	2,020	70	7,296,723	NO	small dam	0.06	135,750	1,100	910,284,255.45	46,698
Peña Corada	RoR	4,990	63	14,389,836	NO	small dam	-----	28,000,000	1270	652,992,878.53	10,136,000
Pereruela	RoR	3,160	75	11,788,000	NO	San Román Reservoir	1.50	1,250,000	3,853	1,007,202,531.65	1,250,000

