

- Final Conference
 Online | 01.12.2021
- A functional approach to energy transition planning
- PROSPECT2030 | Manfred Hotwagner | Giulio Cerino Abdin

CONTENT



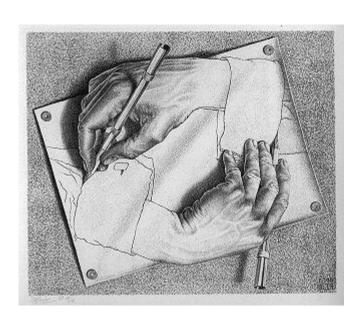
Scenario drafting Introduction Distributed Planning process modification planning Monitoring Investment estimation



TRANSITION PLANNING



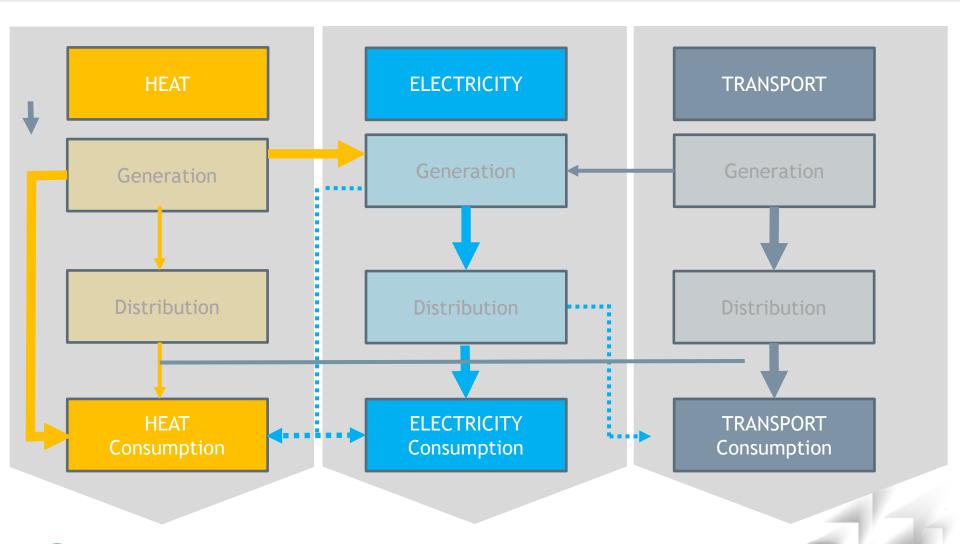
Practice determines mindset Mindset determines practice





VERTICAL - SECTORAL SUPPLY

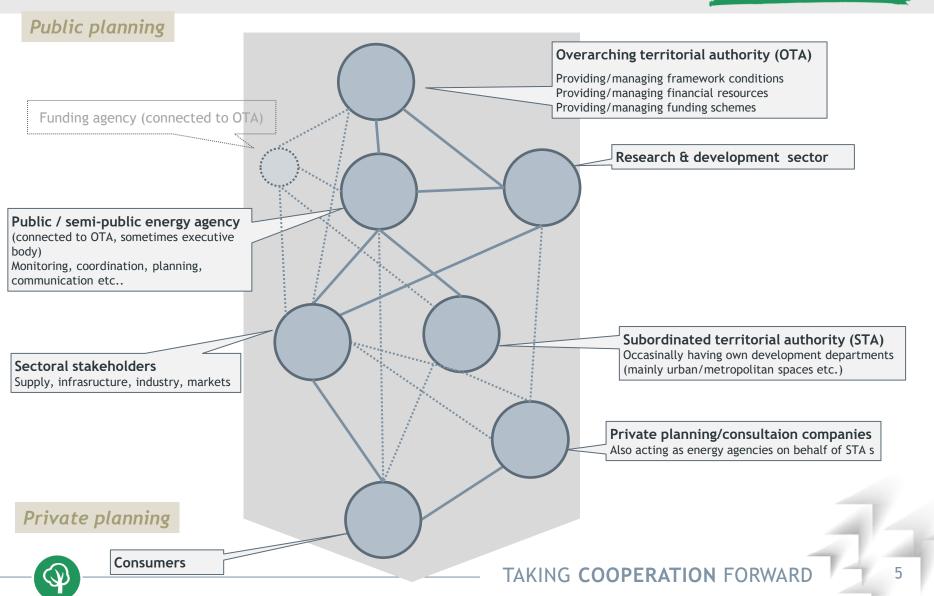






VERTICAL - SECTORAL PLANNING





TRANSITION: ENTERING NEW TERRITORY

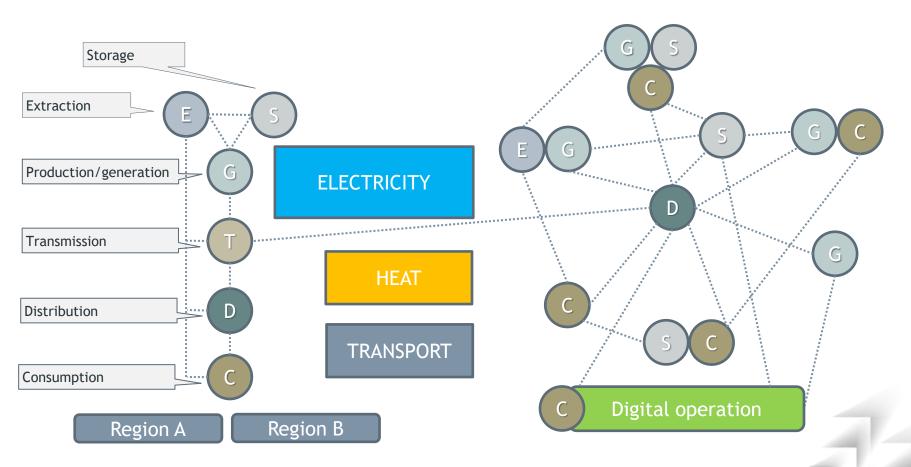


Energy-driven Systems predominately based on combustion

transforming into

Energy- and data-driven (Eco)Systems

with decreasing combustion and an increasing share of electricity

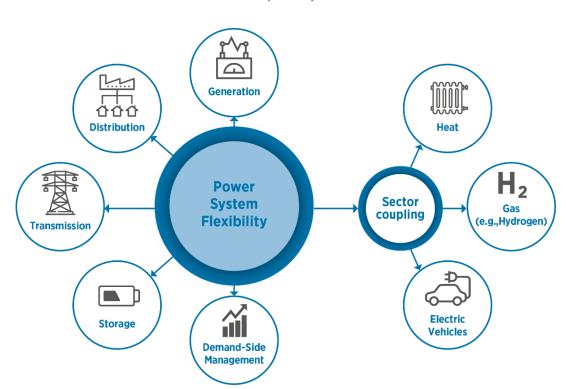




DISTRIBUTED ENERGY SYSTEMS



General principle:



Implementation in reality:



Image source: IRENA



THE CHALLENGE - DISTRIBUTED PLANNING



How to carry out energy planning simultaneously on different levels of governance and infrastructure...

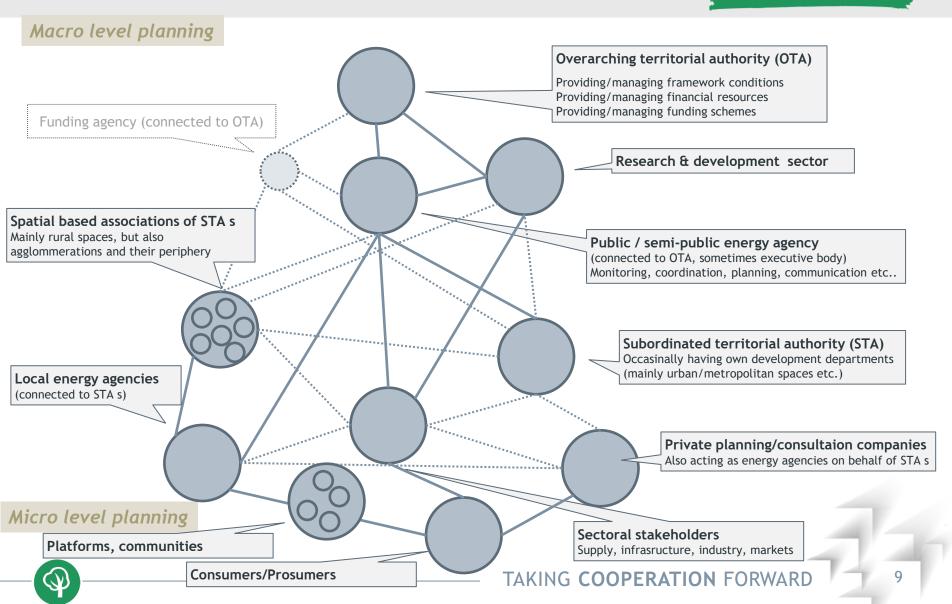
... and nonetheless being capable to achieve comparable, manageable and complementary fitting results



ECOSYSTEM OF DISTRIBUTED ACTORS



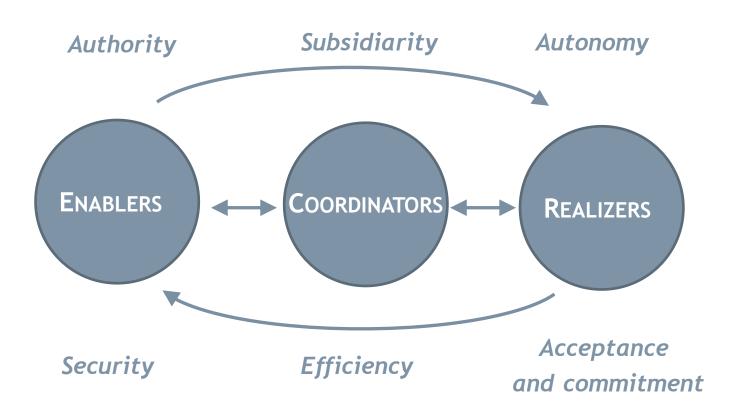




FUNCTIONAL REDUCTION OF ACTORS



Each function can be found on each level of governance As well as across all levels of governance





PLANNING PROCESS MODIFICATION



ACTION DEFINITION: focus on set of instruments

ESTIMATION OF MEASURE IMPACT AND EFFORTS

TESTING REGIONAL TRANSITION READINESS: weighted SWOT

ASSIGNMENT OF MEASURES: type, target sector, responsibility etc.

COMMITMENT OF STAKEHOLDERS

KEY ENERGY PRIORITIES: Specific transition pathways

TRANSITION POTENTIALS

TRANSITION REQUIREMENTS

BASELINE: general conditions, energy consumption, emissions



TRANSITION REQUIREMENTS



Transformation of the power system

to one dominated by renewable energy supply and flexibility in generation, distribution and consumption

Electrification of end-use sectors

to achieve deep decarbonisation

Digitalisation

as the central chainlink of almost all activities and as a new consumption sector

Energy efficiency measures

To achieve the required carbon reductions

Circular and biobased economy

Cascadic use of resources, end-of-lifecycle energy use



TRANSITION REQUIREMENTS



TESTING TRANSITION READINESS



TESTING REGIONAL TRANSITION READINESS:

weighted SWOT

Enabling factors	
Strengths (internal)	3
Chances (external)	3

Restraining factors	
Weaknesses (int.)	2
Threats (ext.)	5

Mapping the Ecosystem

Assigning a weight to respective SWOT issue, e.g. from 1 (low) to 5 (high)



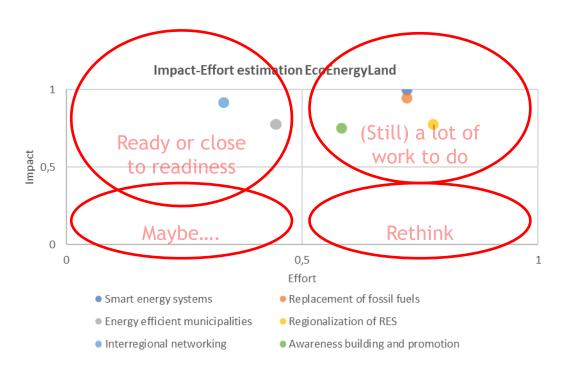
ESTIMATING IMPACT AND EFFORT



ESTIMATION OF IMPACT AND

EFFORTS REGARDING

MEASURES



Mapping the transition readiness
Indicating the relation of effort to achieve impact.

Decision help for action definition



SELECTION OF INSTRUMENTS TO ACT



INSTRUMENTS BY TYPE

ACTION DEFINITION:

which instruments to implement or use to ensure the transition process

- Promoting enabling factors impact
- Reducing restraining factors impact

Policy (guiding)

Planning (connecting)

Organisational (structures)

Financial (models and tools)

Business (models and tools)

Catalizers (awareness related)

Technical (processes)



DRAFTING IMPACT SCENARIOS



Scenario modelling tool:

SHIFT

from fossil to renewable energy sources in consumption

CHANGE

of energy system towards more efficiency and renewable generation



ESTIMATION OF NEEDED INVESTMENTS



Scenario modelling tool delivers results of SHIFT and CHANGE in numbers

Key figures for estimating average investment per unit are available:

Average annual full load hours by technology

€/kW power, €/MWh storage, €/m² thermal refurbishment, €/charging station, €/vehicle, €/ DH connection etc...

As well as public costs for transition promotion



DRAFTING THE MONITORING PROCESS



Monitoring bodies

Monitoring periods

Key performance indicators for evaluation

Possibility:

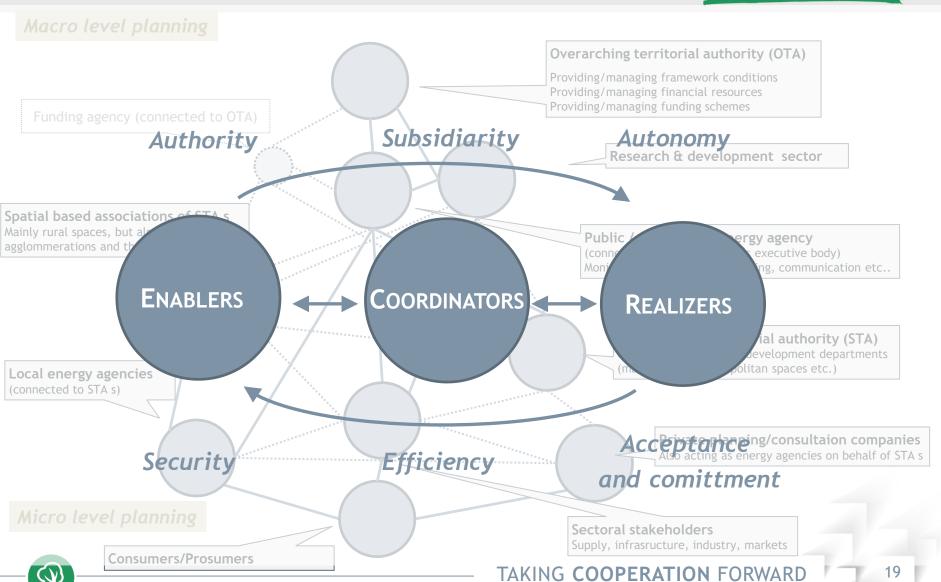
Looping the Weighted-SWOT and Impact-Effort process

Can be used for evaluation



GETTING STRUCTURED







SCENARIO MODELLING TOOL

Presented by Giulio Cerino Abdin (Politecnico di Torino)





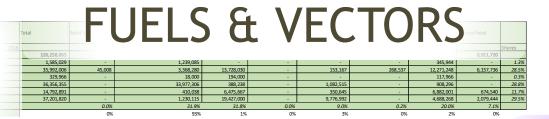
Your PC ran into a problem that it couldn't handle, and now it needs to restart.

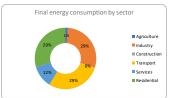
You can search for the error online: HAL_INITIALIZATION_FAILED

BASELINE DEFINITION



SECTORS





Delmana consumation										
Primary consumption										
Primary energy factor (insert national values)		1.10	1.07	1.05		1.00	0.40	1.34	1.50	4
E 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				_						Т
Estimation of regional primary energy demand (MWh)	Total	Solid fossil fuels	Crude oil and petroleum products	Gas	Nuclear heat	Renewable energies	Non renewable wastes	Electricity	Derived heat	
										Si
Primary energy consumption	144,034,087	49,509	43,059,821	42,223,581	-	11,363,318	107,415	33,862,862	13,367,580	·T
Agriculture, forestry and fishing	1,790,435	-	1,325,821					464,614	-	1
Industry (without construction), energy, water sewage etc	44,045,876	49,509	3,604,060	14,414,431		153,167	107,415	16,480,690	9,236,604	1
Construction	381,392	-	19,260	203,700		-	-	158,432	-	1
Transport	39,065,754	-	36,355,717	407,650		1,082,515		1,219,872	-	1
Services	17,843,400	-	438,741	6,799,450		350,645	-	9,242,754	1,011,810	-1
Residential	40,907,230	-	1,316,223	20,398,350		9,776,992	-	6,296,499	3,119,166	1
Shares		0.0%	34.1%	33.4%	0.0%	9.0%	0.1%	26.8%	10.6%	<i>i</i>
Share within transport sector		0%	93%	1%	5 0%	3%	09	3%	0%	6

PRIMARY ENERGY FACTORS

Carbon emissions										
Emission factor (insert appropriate factor)		0.330	0.267	0.202	Ren. General	-	0.333	0.215	0.253	
					Transp. ren. Fuels	0.197				
Estimation of regional energy CO2 emissions (t/a)	Total	Solid fossil fuels	Crude oil and petroleum products	Gas	Nuclear heat	Renewable energies	Non renewable wastes	Electricity	Derived heat	
2016										Shares
Final energy consumption	26,864,914	14,853	10,744,834	8,123,013		213,255	89,423	5,429,327	2,250,209	
Agriculture, forestry and fishing	405,328	-	330,836	-	-	-		74,493	-	1.5%
Industry (without construction), energy, water sewage etc	7,973,892	14,853	899,331	2,773,062	-	-	89,423	2,642,395	1,554,828	29.79
Construction	69,396	-	4,806	39,188	-	-		25,402	-	0.3%
Transport	9,559,206	-	9,071,941	78,424	-	213,255		195,585	-	35.6
Services	3,069,803	-	109,480	1,308,085	-			1,481,917	170,321	11.4
Residential	5,787,290	-	328,441	3,924,254	-	-		1,009,535	525,060	21.5
Shares		0.1%	40.0%	30.2%	0.0%	0.8%	0.3%	20.2%	8.4%	
Transport shares		0%	34%	0%	0%	1%	0%	1%	0%	

CO₂ EMISSIONS FACTORS

Sector	Heat	Electricity	Transport	Share by sector
Agriculture, forestry and fishing	330,836	74,493		2%
Industry (without construction), energy, water sewage etc	3,687,245	2,642,395		24%
Construction	43,994	25,402		0%
Transport		195,585	9,285,196	35%
Services	1,417,565	1,481,917		11%
Residential	4,252,695	1,009,535		20%
Total	9,732,335	5,429,327	9,285,196	91%
Shares	36%	20%	35%	



CHANGE & SHIFT





SHIFT

SPECIFIC CALCULATION AND ACCOUNTING FOR:

- HEAT PUMPS ELECTRICITY NEEDS
 - SHIFT FROM COMBUSTION ENGINE TO ELECTRICAL ENGINE

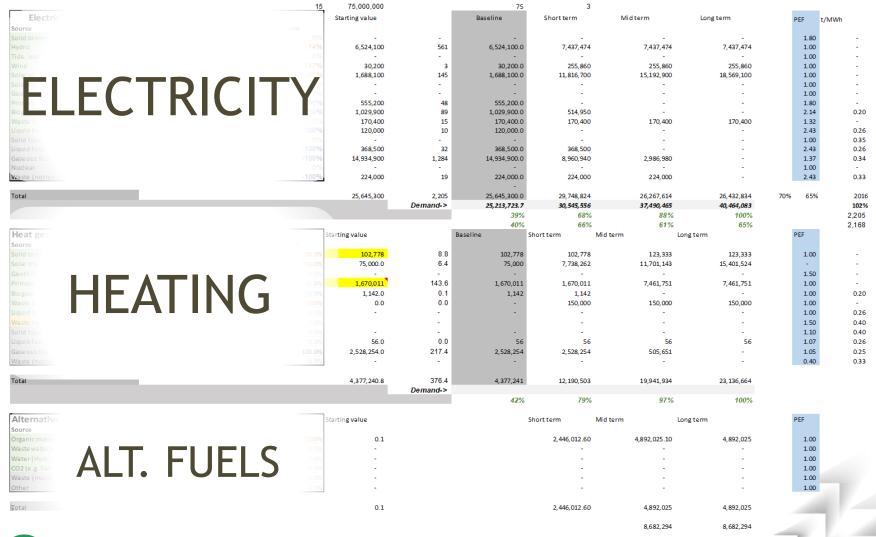




GENERATION MODELLING



PROSPECT2030





FINAL ENERGY, PRIMARY ENERGY & CO2 EMISSIONS



Final consumption scenarios	1																						
Final consumption BASEUNE																							
Estimation of regional final energy demand (MWh)	Solid fossil fuels	Crude oil and petroleum products	Gas Renewable energies	Non renewable wastes	Electricity	Derived heat & grid bound thermal system	otal																
had a few from the first to		1.239.085			345.94		1,585,029																
Agriculture, forestry and fishing Industry (without construction), energy, water sewage etc	45,008	3,368,280		167 268,53			35,992,006																
Construction	-	18,000	194,000		117,966	-	329,966																
Transport Services	-	33,977,306 410.038	388,238 1,083 6.475.667 350		908,296		36,356,355 14,792,891																
Services Residential Total	-	1,230,115	19,427,000 9,776	.992 -	4,688,268		37,201,820																
Total	45,008	40,242,824	40,212,935 11,365	318 268,53	7 25,213,724	8,911,720	126,258,065																
Short term scenario - SHIFT								Mid term scenario - SHIFT								Long term scenario - SHIFT							
Short term scenario - SMFT	Solid fossil fuels	Crude oil and petroleum products	Gas Renewable energies	Non renewable wastes	Electricity	Derived heat & grid bound thormal system	'otal	Mid term scenario - SHIFT	Solid fossil fuels	Crude oil and petroleum Gas products	Renewable energies	Non renewable	Electricity	Derived heat & gri- bound thermal	i Total	Long term scenario - SHIFT	Solid fossil fuels	Crude oil and petroleum	Gas	Renewable energies	Non renewable		erived heat & rid bound Total sermal system
Agriculture, forestry and fishing industry (without construction), energy, water sewage etc	-	830,187	408,898		345,944	-	1,585,029	Agriculture, forestry and fishing		415,093	823,991	. wastes	345,94		1,585,029	Agriculture, forestry and fishing	-	products -	1,2			345,944	- 1,585,029
Industry (without construction), energy, water sewage etc. Construction	30,155	12.060	15,047,502 153 199,940	167 268,53	12,271,246		35,987,550 329,966	Industry (without construction), energy, water sewage etc. Construction	15,078		223,644 15 205.970	167 268,5	12,271,24		35,983,026 329,966	industry (without construction), energy, water sewage etc Construction		-		99,786 153,167 12.000 -	268,53	7 12,271,248	19,885,766 35,978,503 - 329,966
Transport	-	15,289,787	388,238 6,175	110 -	5,438,604		27,295,740	Transport	-		388,238 11,27	706	8,836,33		20,500,279	Transport				38,238 11,275,706	1	8,836,334	- 329,966
Services		-	2,914,050 2,934	.657	7,622,077	1,322,107	14,792,891	Services			457,025 4,02	.644	7,992,11	6 1,322,107	14.792.891	Services				0 5,108,631		8,362,154	1,322,107 14,792,891
Services Residential Total	30.155	16 132 034	8,742,150 17,525 27,700,778 26,795		6,908,497 7 32,704,336	4,022,144	37,201,820 117,192,995	Residential Total	15,078		371,075 20,78 469,943 36.24		8,018,61	1 4,022,144		Residential	-	-	52	- 24,050,950 99,109 40,588,454	268 53		4,022,144 37,201,820 25,230,017 110,388,487
	30,133	10,132,034	27,700,770	,000 200,00	31,704,33	13,301,131	117,132,333	Total .	13,070	42,22	2,24	200,3	37,382,21	1,11,00	110,333,010					40,300,454	100,33	33,002,371	13,130,017
Short term scenario - CHANGE								Mid term scenario - CHANGE								Long term scenario - CHANGE							
Short term scenario - CHANGE	Solid fossil	Crude oil and	Gas Renewable	Non renewable	Electricity	Derived heat & grid bound	'otal	Mid term scenario - CHANGE	Solid fossil	Crude oil and petroleum Gas	Renewable	Non renewable	Electricity	Derived heat & gri- bound thermal	Total	Long term scenario - CHANGE	Solid fossil	Crude oil and petroleum	Gas	Renewable	Non renewable	Electricity g	erived heat & id bound Total
	fuels	petroleum products	energies energies	wastes		thermal system			fuels	products	energies	wastes		system			fuels	products		energies	wastes	ti	ermal system
Agriculture, forestry and fishing Industry (without construction), energy, water sewage etc Construction	- 4.523	- 124,528	- 61,335 - 2,257,125 - 22	975 - 40.28		- 1,232,541	185,863 3,557,445	Agriculture, forestry and fishing Industry (without construction), energy, water sewage etc	- 5,277		288,397 228,275 - 5	608 - 93,90	121,16 18 4,298,05		- 312,511 - 4,001,069	Agriculture, forestry and fishing industry (without construction), energy, water sewage etc	-	-		31,497 - 59,882 - 84,242	147.60	242,337	- 439,160 10,937,171 - 4,442,883
Construction	- 4,323	- 1.809	- 2,257,125 - 22	. 40,20	· :	- 1,232,541	31,800	Construction	- 5,2//		72,090	. 93,9	41.31		- 32,882	Construction	-			16,600 -	247,03	82,636	- 33,964
Transport		- 2,293,468	- 58,236 - 926				3,278,570	Transport			89,295 - 2,59				- 2,682,707	Transport				99,295 - 2,593,412			2,682,707
Services	-	-	- 1,311,323 - 1,320 - 3,496,860 - 7,011		1,825,745		3,559,900 13,943,074	Services Residential			910,641 - 2,51 622,645 - 12,47		- 1,382,02 - 3,170,27			Services	-			0 - 4,086,904 - 19,240,760		- 2,560,522 - - 4,958,846 -	1,057,685 - 7,705,112 3,217,715 - 27,417,322
Services Residential Total	- 4,523	- 2,419,805	- 7,214,869 - 9,281	,049 - 40,28	1 - 2,158,779	3,436,347	24,556,653	Total	- 5,277	- 147,393 -	211,342 - 17,63	542 - 93,9	8 - 91,75	4 8,157,577	- 33,341,873	Residential Total	-	-	- 2,75	57,273 - 26,005,319	147,65	6 1,401,712	15,212,572 - 42,721,147
				•	•						<u> </u>		•	•						•	•		· · · · · · · · · · · · · · · · · · ·
Short term scenario - SHIFT & CHANGE						Derived heat &		Mid term scenario - SHIFT & CHANGE		Crude oil and		hi		Derived heat & gri		Long term scenario - SHIFT & CHANGE		Crude oil and	_	_	here		erived heat &
Short term scenario - SHIFT & CHANGE	fuels	Crude oil and petroleum products	Gas Renewable energies	renewable wastes	Electricity	grid bound thermal system	otal	Mid term scenario - SHIFT & CHANGE	Solid fossil fuels	petroleum Gas products	Renewable energies	renewable wastes		bound thermal system	Total	Long term scenario - SHIFT & CHANGE	Solid fossil fuels	petroleum products	Gas	Renewable energies	renewable wastes	Electricity g	id bound Total ermal system
Agriculture, forestry and fishing Industry (without construction), energy, water sewage etc Construction Transport	25,632	705,659	347,563 12,790,377 130	192 228.25	345,944 5 12,271,248		1,399,166 32,430,104	Agriculture, forestry and fishing Industry (without construction), energy, water sewage etc	9,801		535,594 ,995,369 9		467,11	2 9,133,380	1,272,517 31,981,958	Agriculture, forestry and fishing industry (without construction), energy, water sewage etc	-	-	1,50	57,588 -	120.94	588,280	- 1,145,869 8,948,595 31,535,620
Construction	23,032	10,251	169,949		117,966		298,166	Construction	9,801		133,881	. 1/4,5	159,28		297,084	Construction	-	-		05,400	120,04	200,602	- 296,002
Transport		12,996,319	330,002 5,253		5,438,604		24,017,170	Transport			298,943 8,68		8,836,33		17,817,572	Transport	-		25	38,943 8,682,294		8,836,334	- 17,817,572
Services							11 232 990						6.610.09	4 495 790	9,160,385	Services							
Davids salet			1,602,728 1,614		7,289,043			Services	-		546,384 1,50				46,504,600		1			0 1,021,726		5,801,631	264,421 7,087,779
Residential Total	25,632	13,712,229	5,245,290 10,517		5,082,752	2,413,286		Services Residential Yotal	9,801		546,384 1,50 748,430 8,31 258,601 18,60	996 -	4,848,33	8 1,608,858	16,521,622	Residential Yotal	-		2,4	- 4,810,190		4,169,879	
Residential Total			5,245,290 10,517 20,485,909 17,519	,417 - ,914 228,25	5,082,752 5 30,545,556	2,413,286	23,258,746 92,636,342 7,965.29	Residential Yotal	, ,,,,,,,	273,730	748,430 8,31 258,601 18,60	996 - 965 174,5	4,848,33 19 37,490,46	8 1,608,858 5 11,238,027	16,521,622 77,051,137 6,625.21	Residential Total				- 4,810,190 81,835 14,583,135	120,84	4,169,879 2 40,464,083	804,429 9,784,498 10,017,445 67,667,340 5,818.34
Residential Total			5,245,290 10,517 20,485,909 17,519	.417	5,082,752 5 30,545,556	2,413,286	23,258,746 92,636,342 7,965.29 33,621,724	Residential Total	, ,,,,,,,		748,430 8,31 258,601 18,60	996 -	4,848,33 19 37,490,46	8 1,608,858 5 11,238,027	16,521,622 77,051,137 6,625.21	Residential Total			24 - 37,7	- 4,810,190 81,835 14,583,135 81,100 3,219,817	120,84	4,169,879 2 40,464,083 6 15,250,360	804,429 9,784,498 10,017,445 67,667,340 5,818.34 1,105,725 - 58,590,726
Residential Total			5,245,290 10,517 20,485,909 17,519	,417 - ,914 228,25	5,082,752 5 30,545,556	2,413,286	23,258,746 92,636,342 7,965.29	Residential Yotal	, ,,,,,,,	273,730	748,430 8,31 258,601 18,60	996 - 965 174,5	4,848,33 19 37,490,46	8 1,608,858 5 11,238,027	16,521,622 77,051,137 6,625.21	Residential Total	- 45,008		24 - 37,7	- 4,810,190 81,835 14,583,135	120,84	4,169,879 2 40,464,083 6 15,250,360	804,429 9,784,498 10,017,445 67,667,340 5,818.34
Residential Yotal Delta			5,245,290 10,517 20,485,909 17,519	,417 - ,914 228,25	5,082,752 5 30,545,556	2,413,286 5 10,124,845 1 1,213,124	23,258,746 92,636,342 7,965.29 33,621,724	Residential Yotal	, ,,,,,,,	273,730	748,430 8,31 258,601 18,60	996 - 965 174,5	4,848,33 19 37,490,46	8 1,608,858 5 11,298,027 1 2,326,307	16,521,622 77,051,137 6,625,21 - 49,206,928	Residential Total			24 - 37,7	- 4,810,190 81,835 14,583,135 81,100 3,219,817	120,84	4,169,879 2 40,464,083 6 15,250,360 17 0.597985429	804,429 9,784,498 10,017,445 67,667,340 5,818.34 1,105,725 58,590,726 0.148039583
heridential Total Daita Short term primary consumption Short term primary consumption	- 19,376 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products	5,245,200 10,517 20,485,909 17,519 - 19,777,026 6,150 Gas Renewable energies	,417 - ,914 228,25	5,082,752 5 30,545,556 1 5,331,833 Electricity	2,413,286 10,124,845 1,213,124 Derived heat & grid bound thermal system	23,258,746 92,636,342 7,965.29 33,621,724 7,965.29	Medicalid Colta Mid term primary consumption Mid term primary consumption	, ,,,,,,,	273,730 : 273,730 : 30,969,094 - 31 Crude oil and petroleum Gas products	748,430 8,31 258,601 18,60 954,333 7,24 Renewable energies	996 - 965 174,5	4,848,33 37,490,46 18 12,276,74	8 1,608,858 5 11,238,027 1 2,326,307 Derived heat & gri bound thermal system	16,521,622 77,651,137 6,625,21 - 49,205,928 Total	Serial Total Ooita Long term primary consumption Long term primary consumption			24 - 37,7: 0 0.036	- 4,810,190 81,885 14,583,135 81,100 3,219,817 677001 0.21551216 Renewable energies	120,84	4,169,879 2 40,464,083 6 15,250,360 17 0.597985429 Electricity 8	804,429 9,784,498 10,017,445 67,607,340 5,818,41 1,105,725 S8,590,726 0,148039583 erived heat & id bound Total
heridential Total Daita Short term primary consumption Short term primary consumption	- 19,376 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055	5,245,290 10,51 20,485,999 17,511 - 19,727,026 6,150 Gas Renewable energies 364,941	A17 914 228,25 ,596 - 40,28 Non renewable wastes	5,082,752 5 30,545,556 1 5,331,833 Bectricity 400,356	2,413,286 10,124,845 1,213,124 Derived heat & grid bound thermal system	23,258,746 92,686,342 7,965.29 33,621,724 7,965.29 Total	Residential Osita Osita Osita Ositia Osit	- 35,208 Solid fossil fuels	279,730 : 279,730 : 30,960,094 - 30 Crude oil and petroleum Gas products : 288,697	748,430 8,31 258,601 18,60 954,333 7,24 Renewable energies 562,374	996 - 985 174,5 .646 - 93,9 Non renewable wastes -	4,848,33 37,490,46 18 12,276,74 Electricity 485,55	8 1,600,858 5 11,238,027 1 2,326,307 Derived heat & gribound thermal system 3	16,521,622 77,651,137 6,625,21 - 49,206,928 Total	Insidential Total Costa Costa Long term primary consumption Long term primary consumption Agriculture, Forestry and Eshing	Solid fossil	Crude oil and	24 - 37,75 0 0.036 Gas	4,810,190 14,883,183 14,188,183 11,100 3,219,817 677001 0,21551216 Renewable energies 85,467	1 120,84 1 120,84 2 147,65 9 0.0017858 Non renewable wastes	4,169,879 2 40,464,083 6 15,250,360 17 0.597985429 Electricity 8 589,073	804,429 9,784,498 10,017,445 97,607,340 11,105,725 S8,590,726 0.1480399583 erived heat & did bound Total semal system 1,174,541
heridential Total Daita Short term primary consumption Short term primary consumption	- 19,376 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055	\$,245,290 10,51 20,485,909 17,51 - 19,777,026 6,150 Gas Renewable energies 364,941 13,479,896 133	.417914 228,25 .596 - 40,28	5,082,752 5 30,545,556 1 5,331,833 Electricity 400,356 2 14,201,346	2,413,286 10,124,845 1,213,124 Derived heat & grid bound thermal system 10,476,599	23,258,746 92,636,342 7,965,29 33,621,724 7,965,29 Total 1,520,352 38,357,530	Residential Total Osta Add bern primary consumption Add tern primary consumption Add tern primary consumption Agriculture, foreory and falling Agriculture, foreory and falling	- 35, 208 Solid fossil fuels	273,730 :	748,430 8,31 258,601 18,60 954,333 7,24 Renewable energies 562,374 9	996 - 965 174,5 646 - 93,9	4,848,33 37,490,46 8 12,276,74 Electricity 485,55	8 1,608,858 5 11,238,027 1 2,326,307 Derived heat S. gribound thermal system 3 13,700,069	16,521,622 77,661,137 6,625,21 - 49,206,928 Total 1,336,624 37,398,782	Testal Control Conta	Solid fossil	Crude oil and	24 - 37,75 0 0.036 Gas	81,895 14,583,193 31,100 3,219,817 677001 0,21551216 Renewable emergies 55,467 56,399 68,925	1 120,84 1 120,84 2 147,65 9 0.0017858 Non renewable wastes	4,169,879 2 40,464,083 6 15,250,360 17 0.597985429 Electricity 8 580,073 7 20,995,476	804, 429 9,784,468 10,077,445 67,667,340 11,105,725 - 58,590,726 0,146399583 arrived heaft & fid bound Total emmal gystem - 1,174,541 13,422,929 36,042,038
heridential Total Daita Short term primary consumption Short term primary consumption	- 19,376 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055	5,245,290 10,51 20,485,999 17,511 - 19,727,026 6,150 Gas Renewable energies 364,941	,417	5,082,752 5 30,545,556 1 5,331,833 Bectricity 400,356	2,413,286 i 10,124,845 i 1,213,124 Derived heat & grid bound thermal system i 10,476,599	23,258,746 92,686,342 7,965.29 33,621,724 7,965.29 Total	Residential Osita Osita Osita Ositia Osit	- 35,208 Solid fossil fuels	279,730 : 279,730 : 39,969,094 - 30 Crude oil and petroleum Gas products 288,697 - 4,194	748,430 8,31 258,601 18,60 954,333 7,24 Renewable energies 562,374	996 - 965 174,5 646 - 93,9 Non renewable wastes - 9,8 - 9,8	4,848,33 37,490,46 18 12,276,74 Electricity 485,55	8 1,600,858 5 11,238,027 1 2,326,307 Derived heat & gribound thermal system 3 - 13,700,069	16,521,622 77,651,137 6,625,21 - 49,206,928 Total	Insidential Total Costa Costa Long term primary consumption Long term primary consumption Agriculture, Forestry and Eshing	Solid fossil	Crude oil and	24 - 37,7: 0 0.036 Gas 51	4,810,190 14,883,183 14,188,183 11,100 3,219,817 677001 0,21551216 Renewable energies 85,467	1 120,84 7 - 147,69 9 0.0017858 Non renewable wastes 6 48,33	4,169,879 2 40,464,083 6 15,250,360 17 0.597985429 Electricity 8 589,073	804,429 9,784,498 10,017,445 97,607,340 11,105,725 S8,590,726 0.1480399583 erived heat & did bound Total semal system 1,174,541
Nacional Geld Data Data Data Dant tere primary consumption Short tere primary consumption Aprillation, forestly and failing Industry in the forestly and failing Construction construction, energy, water savage at Consulta	- 19,376 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055	\$,346,200 10,511 20,485,909 17,511 - 19,777,026 6,150 Gast enerwable energies 364,941 174,459,996 130 - 177,446 345,931 3,459,941 345,931 3,459,941 345,931 3,459,941 345,931 3,459,941 345,931 3,459,941	,417	5,082,752 5 30,545,594 1 5,331,833 Electricity 400,356 2 14,201,345 136,532 6,294,020 8,435,500	2,413,286 10,124,945 1,213,124 1,213,124 Derived heat & grid bound thermal system 10,476,599	23,258,746 92,858,342 7,965,29 33,621,724 7,965,29 (otal 1,520,352 33,357,530 315,935 27,788,229 12,873,377	Product of Test Test Salts Mid term primary consumption Mid term primary consumption Agriculture, forcety and fidning Agriculture, forcety and fidning modularly failbling consumption Consumer Con	- 35,208 Solid fossil fuels	273,730 1 39,960,094 3 Crude oil and petroleum Gas products 288,697	748,430 8,31 238,601 18,60 954,333 7,24 Rene wable energies 562,374 226,137 9 340,575 313,891 8,688 573,704 1,50	996 955 174,5 646 - 93,9 Non renewable wastes 559 69,8 116 1	4,848,33 37,499,46 88 12,276,74 Electricity 485,55 00 12,223,41 165,57 9,185,17 6,871,04	8 1,608,658 5 11,238,022 1 2,326,307 Derived heat & gri bound thermal system 3 7 13,700,066 2 1	16,521,622 77,061,137 6,625,21 49,205,928 Total 1,336,624 37,368,762 310,341 18,181,355 9,605,549	Train and the second of the se	Solid fossil	Crude oil and	24 - 37,7: 0 0.036	81,895 34,581,135 34,581,135 31,100 3,219,817 677001 0.21551216 Renewable energies 55,679 68,925 00,170 1,002,726 00 1,002,726 00 1,002,726 00 1,002,726 00 1,002,726 00 1,002,726 00 1,002,726 00 1,002,726 00 1,002,726	120,84 120,84 1 - 147,66 9 0.0017858 Non renewable wastes is 48,33	4,169,879 40,664,083 6 15,250,360 17 0.597985429 Electricity 8 11 17 20,995,476 200,672 8,848,242 5,309,450	89.4.29 9.794.486 10.027.29 1.794.486 11.00.77.49 5.841.34 1.105,725 5.841.34 1.105,725 0.146030583 17044 17
Nacional Geld Data Data Data Dant tere primary consumption Short tere primary consumption Aprillation, forestly and failing Industry in the forestly and failing Construction construction, energy, water savage at Consulta	Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055 10,969 13,906,062	\$346,509 10551 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 20,4941 31,449,941 31,449,961 31,4	A17	5,002,752 5,301,485,596 1,5,331,833 Electricity 400,356 2,142,701,348 1,165,701 1,485,701 1	2,413,286 10,124,945 1,213,124 Derived heat & grid bound thermal system 10,476,599 1,000,738 3,639,330	23,258,746 92,836,342 7,965,29 33,621,724 7,965,29 Cotal 1,520,352 38,357,350 325,395 27,766,329 12,823,727 25,527,260	Residential Fletal Oolta And term primary consumption Med term primary consumption Septiments, forestry and follows Septiments, forestry and follows Constitution Constitution Constitution Constitution Constitution Constitution	Solid fossil fuels	223,730 : 223,730 : 33,969,004 . 3	748,430 8,31 238,601 18,60 258,601 18,60 254,333 7,24 Renewable energies 562,374 9 205,137 9 213,891 8,68 573,704 1,50 338,852 8,388,852	996 - 93,9 Non renewable wastes	4,848,33 37,490,46 88 12,276,74 Electricity 485,55 00 17,223,41 165,57 9,185,17 6,877,04 5,019,73	8 1,608,858 5 11,238,027 1 2,326,307 Derived heat & gris bound thermal system 3 7 13,700,066 2 1 4 743,683 9 2,413,288	16,521,622 77,651,337 6,625,21 - 49,205,928 Total 1,336,624 37,368,762 310,341 18,181,355 9,606,549 17,604,873	The advanced State Solita So	Solid fossil	Crude oil and	Gas Si 1,6i 31	81,835 14,881,185 14,881,185 14,881,185 14,881,185 14,881,185 14,881,185 1767001 0,21551216 Renewable energies 5,5,309 68,925 0,170 0 1,021,70	120,84 147,69 0.0017858 Non renewable wastes 48,33	4,169,879 2 40,464,083 5 15,250,360 17 0.597985429 Electricity 0 8 589,073 7 20,895,476 200,697 8,048,72 8,048,72 8,039,450 4,175,499	89.4.29 9.794.481 10.017.465 57.667.360 11.00.77.465 5.818.34 11.00.725 5.818.34 11.00.725 58.500.726 0.140099583 eriwed heat 8 id bound Total ermal oystem 13.422,890 36.002,098 13.422,803 36.002,098 13.423,803 7.222,808
Necotional Final Outs	- 19,376 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055 10,969 13,906,062	\$,346,200 10,511 20,485,909 17,511 - 19,777,026 6,150 Gast enerwable energies 364,941 174,459,996 130 - 177,446 345,931 3,459,941 345,931 3,459,941 345,931 3,459,941 345,931 3,459,941 345,931 3,459,941	A17	5,002,752 5,301,485,596 1,5,331,833 Electricity 400,356 2,142,701,348 1,365,756 1,365,756 1,485,700 5,882,196 5,882,196	2,413,286 10,124,945 1,213,124 Derived heat & grid bound thermal system 10,476,599 1,000,738 3,639,330	23,258,746 92,858,342 7,965,29 33,621,724 7,965,29 (otal 1,520,352 33,357,530 315,935 27,788,229 12,873,377	Product of Test Test Salts Mid term primary consumption Mid term primary consumption Agriculture, forcety and fidning Agriculture, forcety and fidning modularly failbling consumption Consumer Con	- 35,208 Solid fossil fuels	223,730 : 223,730 : 33,969,004 . 3	748,430 8,31 238,601 18,60 954,333 7,24 Rene wable energies 562,374 226,137 9 340,575 313,891 8,688 573,704 1,50	996 - 93,9 Non renewable wastes	4,848,33 37,490,46 88 12,276,74 Electricity 485,55 00 17,223,41 165,57 9,185,17 6,877,04 5,019,73	8 1,608,858 5 11,238,027 1 2,326,307 Derived heat & gris bound thermal system 3 7 13,700,066 2 1 4 743,683 9 2,413,288	16,521,622 77,651,337 6,625,21 - 49,205,928 Total 1,336,624 37,368,762 310,341 18,181,355 9,606,549 17,604,873	Train and the second of the se	Solid fossil	Crude oil and	24 - 37,7: 0 0.036	81,835 14,881,185 14,881,185 14,881,185 14,881,185 14,881,185 14,881,185 1767001 0,21551216 Renewable energies 5,5,309 68,925 0,170 0 1,021,70	120,84 147,69 0.0017858 Non renewable wastes 48,33	4,169,879 2 40,464,083 5 15,250,360 17 0.597985429 Electricity 0 8 589,073 7 20,895,476 200,697 8,048,72 8,048,72 8,039,450 4,175,499	89.4.29 9.794.486 10.027.29 1.794.486 11.00.77.49 5.841.34 1.105,725 5.841.34 1.105,725 0.146030583 17044 17
Nacidential (field Data term primary consumption Short term primary consumption Short term primary consumption Constitution of the constitution of the consumption Constitution of the constitution of the consumption Constitution of the consumption of the	- 19,376 Solid fossil fuels - 28,195 - 28,195	- 26,530,595 Crude oil and petroleum products 755,055 10,969 13,906,062	5,346,290 10,511 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 36,49,941 31,449,941	A17	5,082,75; 5 30,545,566 1 5,331,833 Electricity 400,355 2 14,201,345 6,245,050 8,485,050 5,882,196 2 33,349,560	2,413,286 10,128,845 1,213,124 1,213,124 Derived heat & grid bound thermal system 10,476,599 1,090,738 1,519,930 15,187,267	22, 258, 746 92,686, 342 7,965, 29 33,621,724 7,965, 29 (etal 1,520, 352 33,357,530 315,935 27,862,327 22,527,209 12,823,272 25,527,209 10,832,373	Product of Test Test Salts Mid term primary consumption Mid term primary consumption Agriculture, forcety and fidning Agriculture, forcety and fidning modularly failbling consumption Consumer Con	- 35,208 Solid fossil fuels - 10,781	223,730 : 223,730 : 33,969,004 . 3	748,410 8.31 258,601 18,60 954,333 7,24 86,601 18,60 954,333 7,24 954,337 9 100,035 313,891 8,68 573,704 1,50 313,891 8,68	996	Hectricity Electricity 485,55 10 12,276,74 Electricity 485,55 10 17,23,41 165,57 9,185,17 6,871,06 5,039,73 10 38,979,49	8 1,608,658 5 11,238,027 1 2,326,307 Derived heat & gri bound thermal system 3 1 13,700,066 7 13,700,066 7 14 743,655 7 16,857,041	16,521,622 77,651,137 6,625,21 - 49,206,928 10,206,928 10,336,624 37,398,762 310,341 18,181,341 18,181,341 18,181,341 18,181,341 18,181,341 18,181,341 18,181,341 18,181,341	The advanced State Solita So	Solid fossil fuels	Crude oil and	Gas Si 1,66 111 3: - 2,68	4,510,100 18,885 14,583,185 14,583,185 3,110 3,119,110 3,119,110 3,119,110 3,119,110 3,119,110 3,119 3	120,84 147,69 0.0017858 Non renewable wastes 48,33	4,568,879 4,464,683 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 16,242 15,260,460 14,175,960 17 16,242,42 15,260,460 14,175,960 17 16,242,42 15,260,460 17 17 18,246,242 18,246,246	50.429 37.84 (all 150.219 17.84 (all 150.219
Nacidential Glad Data Shari keen primary consumption Short keen primary consumption Short keen primary consumption Short keen primary consumption Short construction of S	- 19,376 Solid fossil fuels - 28,195 - 28,195	- 26,530,595 Crude oil and petroleum products 755,055 10,960 13,906,062	5,346,290 10,511 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 36,49,941 31,449,941		5,082,75; 5 30,545,566 1 5,331,833 Electricity 400,355 2 14,201,345 6,245,050 8,485,050 5,882,196 2 33,349,560	2,413,286 10,128,845 1,213,124 1,213,124 2,213	23,258,746 92,856,342 7,965,29 33,621,724 7,965,29 (otal 1,520,352 33,535,355 27,788,339 12,823,722 24,537,200 34,352,739 8,977,20	Necessaria Testa Salta Mid term primary consumption Mid term primary consumption primary consumption And term primary consumption primary consum	- 35,208 Solid fossil fuels - 10,781	273,730 - 30,660,04 - 3 Crude Oil and Gus probusts (Gus probusts (Gus probusts (Gus probusts (Gus probusts (Gus probusts (Gus Gus Gus Gus Gus Gus Gus Gus Gus Gus	748,410 8.31 258,601 18,60 954,333 7,24 86,601 18,60 954,333 7,24 954,337 9 100,035 313,891 8,68 573,704 1,50 313,891 8,68	996	Hectricity Electricity 485,55 10 12,276,74 Electricity 485,55 10 17,23,41 165,57 9,185,17 6,871,06 5,039,73 10 38,979,49	8 1,608,855 5 11,288,027 1 2,326,307 Derived heat 8, gri bound thermal yetem 3 7 13,700,066 2 1 743,026 5 16,857,041 3 3,489,463	16,521,622 77,651,77 6,625,21 - 49,205,928 10,105,790,792 310,341 18,181,355 9,605,540 17,604,873 84,528,27 7,268,14	The content of the co	Solid fossil fuels	Crude oil and petroleum products	Gas Si 1,66 111 3: - 2,68	4,510,100 18,885 14,583,185 14,583,185 3,110 3,119,110 3,119,110 3,119,110 3,119,110 3,119,110 3,119 3	120,84 120,84 - 147,66 9 0.0017858 Non tenswable wastes 48,33 - 1	4,568,879 4,464,683 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 15,250,360 17 16,242 15,260,460 14,175,960 17 16,242,42 15,260,460 14,175,960 17 16,242,42 15,260,460 17 17 18,246,242 18,246,246	BN C-22 9,786,481 DR T_450 5,888.84 1,106,735 5,888.84 1,106,735 5,859.0,756 0.4460/best 8 1.06 75 1.064 1.06 75 1.064 1.06 75 1.064 1.06 75 1.064 1.06 75 1.064 1.06 75 1.064 1.06 75 75 1.06 75 1.06
Nacionaria (Staf Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta Onta	- 19,376 Solid fossil fuels - 28,196 28,195 - 21,314	- 26,530,595 Crude oil and petroleum products 755,055 10,960 13,906,062	5,346,290 10,511 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 20,485,509 12,531 36,49,941 31,449,941	A17	5,082,75; 5 30,545,566 1 5,331,833 Electricity 400,355 2 14,201,345 6,245,050 8,485,050 5,882,196 2 33,349,560	2,413,266 10,128,985 1,213,124 1,213,124 1,213,124 1,213,124 1,213,124 1,000,738 1,000,738 1,619,930 1,518,9687 1,819,687	23,258,746 92,856,342 7,965,29 33,621,724 7,965,29 (otal 1,520,352 33,537,505 27,788,329 12,823,722 24,527,200 34,352,759 8,977,20	Necessaria Testa Salta Mid term primary consumption Mid term primary consumption primary consumption And term primary consumption primary consum	- 35,208 Solid fossil fuels - 10,781	227,700 1 227,700 1 3 27,700 1 3 27,700 1 3 27,700 1 3 27,700 1 3 28,289 1 2 28,289 1 2 28,289 1 3	748,410 8.31 258,601 18,60 954,333 7,24 86,601 18,60 954,333 7,24 954,337 9 100,035 313,891 8,68 573,704 1,50 313,891 8,68	996	Heat 12, 276, 74 Electricity 485, 55 10 17,223,41 5,079,74 5,079,74 6,077,07 5,107,63	8 1,608,658 5 11,238,027 1 2,326,307 Derived heat & gri bound thermal system 3 1 13,700,066 7 13,700,066 7 14 743,655 7 16,857,041	16,521,622 77,651,77 6,625,21 - 49,205,928 10,105,790,792 310,341 18,181,355 9,605,540 17,604,873 84,528,27 7,268,14	The content of the co	Solid fossil fuels	Crude oil and petroleum products	Gas Si 1,66 111 3: - 2,68	4,510,100 18,885 14,583,185 14,583,185 3,110 3,119,110 3,119,110 3,119,110 3,119,110 3,119,110 3,119 3	120,84 120,84 - 147,66 9 0.0017858 Non tenswable wastes 48,33 - 1	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	80.42 9,706.239 1,706.239
Nacidential (field Data temp finan; ciniumpition Short tem primar; ciniumpition Short tem primar; ciniumpition Short temp relinan; ciniumpition Short temp relinan; ciniumpition Short temp relinan; ciniumpition Ciniumpition Timmport Timmport Constant Short temp carbon environment	- 19,376 Solid fossil fuels - 28,196 28,195 - 21,314	- 26,530,595 Crude oil and petroleum products 755,055 - 10,969 - 13,906,062 - 14,672,085 - 28,387,736 Crude oil and	\$3,45,20 13,517 20,455,20 13,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,455,20 15,517 20,471,377 6,156	A17 A28,25 A0,28 A0,28	5,082,75: 5,082,75: 1 5,331,83: Electricity 400,356: 2 14,001,356: 6,294,02: 6,294,02: 8,485,20: 8,485,20: 8,485,20: 1,487,088	2,413,266 10,124,945 1,213,124 1,213,124 Derived heat & grid bound thermal system 10,476,599 1,090,738 1,819,939 15,187,267 Derived heat & grid bound	23, 258, 746 24, 258, 746 27, 565, 29 33, 631, 724 7, 565, 29 (otal 1,530, 352 88, 357, 530 335, 353 52, 746, 329 24, 257, 260 304, 352, 753 88, 357, 530 325, 326 325, 326 325, 326 325, 326 325, 326 325, 326 325, 326 326, 327 326, 327 326, 327 326, 327 326, 327 327, 327	Teceborat II Final Salta Mid from primary consumption Mid from primary consumption Mid from primary consumption And the primary consumption C	- 35,208 Solid fossil fuels - 10,781 38,728	273,780 1 3 5,000,004 3 3 5,000,004 3 5 5,000,004 3 5 5,000 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	748,400 8.31 258,601 18,60 954,333 7,24 8enewabble energies 562,374 9 126,137 9 144,575 313,874 8,68 373,874 8,68 373,874 8,68 373,874 8,68 373,874 8,68 373,874 8,68 373,874 8,68 373,874 8,68 374,675 8,74 374,675 8,74 375,675 8,75 375,675	996 174,5-5 546 - 93,9 Non renewable wattes	Heat 12, 276, 74 Electricity 485, 55 10 17,223,41 5,079,74 5,079,74 6,077,07 5,107,63	8 1.606,835 5 11,238,022 1 2,326,307 1 2,326,307 1 2,326,307 2 1 12,700,056 3 7 12,700,056 2 1 12,700,056 3 7 13,700,057 3 7 1	16,521,622 77,651,77 6,625,21 - 49,205,928 10,105,790,792 310,341 18,181,355 9,605,540 17,604,873 84,528,27 7,268,14	Test descript Seria Seria Jang Seria primary concumption Long Seria Long Seri	Solid fossil fuels	Crude oil and petroleum products	Gas Sign Sign Sign Sign Sign Sign Sign Sign	- 4,510,100 - 14,581,130 - 3,10,81 - 31,100 - 3,10,81 - 8,10,81	120,848 120,84	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	80.4 22 9.786, etc. 1 1,105,725 1 1,105,72
Nacidential (field Data temp finan; ciniumpition Short tem primar; ciniumpition Short tem primar; ciniumpition Short temp relinan; ciniumpition Short temp relinan; ciniumpition Short temp relinan; ciniumpition Ciniumpition Timmport Timmport Constant Short temp carbon environment	- 19,376 Solid fossil fuels - 28,196 28,195 - 21,314	- 26,530,595 Crude oil and petroleum products 755,055 - 10,969 - 13,966,062 - 28,387,736 Crude oil and petroleum products	\$3,40,500 15331 26,40,500 15331 26,40,500 15331 26,40,500 15331 26,40,500 15331 26,4041 27,10,4041	A17	5,002,75,766 30,945,566 1	2,413,286 10,124,895 11,213,124 11,213,124 11,213,124 11,213,124 11,213,124 11,213,124 11,213,124 11,213,124 11,213,125 11,213,227 11,213,227 11,213,227 11,213,227 12,213,227 12,213,227 13,213,227 1	22,838,746 22,838,746 23,632,747 2,965,29 36,627,747 2,965,29 38,357,540 38,3	Teceborist Total Sala	- 35,208 Solid fossil fuels - 10,781 38,728	272,700 1 272,700 1 30,560,004 - 3 5 Crude oil and particle um Gas products 288,607 1 4,194 1	748,410 8,31 728,601 18,60 18,	996 174,5-5 546 - 93,9 Non renewable wattes	### Hedricky Hedricky Hedricky	8 1,568,858 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,027 5 11,288,028 5 11,288,048 5 11,2	16,521,632 77,061,177 6,625,21 - 49,106,938 1,136,634 37,988,782 310,341 18,181,355 9,666,50 17,604,873 84,528,78 7,261,14 10,	Trace actions of the control of the	Solid fossil fuels	Crude oil and petroleum products	Gas Gas Gas Si 1,66 11 3. 2,69 Gas Gas Gas	4.510,100 1.4535 1.4586,135 1.4586,135 1.4586,135 Fannewable energies 5.667 5.569 6.0255,1216 Fannewable energies 1.3,101 1.3,1	120,848 120,84	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	86,42 9,766,390 1,766,401 1,100,402 1,000,402
Nacidential Glid Data temp plinary consumption Short temp prinary consumption Short temp prinary consumption Short temp prinary consumption Short temp prinary consumption Construction Constr	- 19,376 Solid fossil fuels - 28,195 28,195 - 21,314 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055 - 10,990 - 13,906,062 - 28,387,736 Crude oil and petroleum products 188,411 - 2,237	13-0-20 15331 18,777,005 6,155 Gas Score and S		5.082.75.75.81 5.331.831 6.32.75.75.75.75.75.75.75.75.75.75.75.75.75.	2.41,286 10,134,845 1,211,124 1,211,	22,283,746 28,684,847 7,965,29 1,965,29 38,637,28 38,637,38 38,637,38 38,637,380 32,387,380 32,387,387 32,387,387 32,387,387 32,387,387 32,387,387 32,387,387 32,387,387 32,387,387 32,387,387 32,387,387 32,681,468	Teceborat II Chale Salta Salta Service Serv	- 35,208 Solid fossil fuels - 10,781 - 1,781 - 38,728 Solid fossil fuels - 1,781 - 1	272,700 1 272,700 1 30,560,004 - 3 5 Crude oil and particle um Gas products 288,607 1 4,194 1	744.450 8.31.328.601 145.606 8.31.33 7.24 8.31 8.31 8.31 8.31 8.31 8.31 8.31 8.31	996 174,5 646 93,9 Non enewable evades 550 68,8 -294 - 116 - 996 996 - 37,59 Non enewable evades - 5550 68,8 - 7564 - 77,50	# 4,943,31 # 37,69,66 # 12,776,74 # 12,776,74 # 16,57 # 17,723,41 # 16,57 # 17,723,41 # 17,724 # 18,77,66 # 19,77,66 # 19,77,67 # 19,77 # 19	8 1.288,627 1 1.288,627 1 2.36,807 Derived heat & grip grip grip grip grip grip grip grip	15,571,622 17,061,197 6,633,41 40,205,038 176tal 1,336,634 32,386,787 130,481 1,336,537 1,366,53	Treatment Serial	Solid fossil fuels	Crude oil and petroleum products	Gas Signature Control of Case Signature Case Signat	18.855 14.588.159.100 18.1505 14.588.159.100 18.11.00 2.155.121.00 18.11.00 2.255.121.00 Pannewable seringias 18.450 0.2555.121.00 Pannewable seringias 18.450 0.00 18.450 0	120,84 1-247,66 9 0.0017858 Non tenewable wastes	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	86,429 37,86,681 3807,496 57,25 58,683,391 3,107,79 58,696,797 3,1
Neutonaria (Staf Ont temp fining concumption Don't temp prinsy concumption Don't temp prinsy concumption Don't temp prinsy concumption Don't temp prinsy concumption Control temp con	- 19,376 Solid fossil fuels - 28,195 28,195 - 21,314 Solid fossil fuels	- 26,530,595 Crude oil and petroleum products 755,055 - 10,969 - 13,966,062 - 28,387,736 Crude oil and petroleum products	\$3,40,500 15331 26,40,500 15331 26,40,500 15331 26,40,500 15331 26,40,500 15331 26,4041 27,10,4041		5,002,75,766 30,945,566 1	2.41,266 10.124,845 10.124,845 10.124,845 10.124,845 10.124,124 10	22.58,746 28.68,847 7,965.29 7,965.29 38,627,746 7,965.29 1.530.852 8.152,530 8.252,530 2.788,629 2.788,629 2.788,629 3.965,71,748,748,748,748,748,748,748,748,748,748	Teceborate T Chald Salta Salta Salta Salta Mal term primary consumption Consumption Mal term primary consumption Mal term primary consumption Mal term confidence Mal term confidence Agricultural Mal term confidence Agricultural Mal term confidence Agricultural Mal term confidence Mal term confidence Agricultural Mal term confidence Mal term confidenc	- 35,208 Solid fossil fuels - 10,781 - 1,781 - 38,728 Solid fossil fuels - 1,781 - 1	272,720	744.450 8.31.328.601 145.606 8.31.33 7.24 8.31 8.31 8.31 8.31 8.31 8.31 8.31 8.31	996 174,5 969 174,5 969 174,5 97 97 97 97 97 97 97 97 97 97 97 97 97	### Hedricky Hedricky Hedricky	1,668,651,626,631,632,632,632,632,632,632,632,632,632,632	15,571,627 7,061,127 6,625.21 7,061,027 7,07 7,07 7,07 7,07 7,07 7,07 7,07	Trace accessed Total Onita Long form primary consumption L	Solid fossil fuels	Crude oil and petroleum products	Gas Signature Control of Case Signature Case Signat	4.510,100 1.4535 1.4586,135 1.4586,135 1.4586,135 Fannewable energies 5.667 5.569 6.0255,1216 Fannewable energies 1.3,101 1.3,1	120,84 1-247,66 9 0.0017858 Non tenewable wastes	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	86,42 9,766,390 1,766,401 1,100,402 1,000,402
Neutonaria (Staf Ont temp fining concumption Don't temp prinsy concumption Don't temp prinsy concumption Don't temp prinsy concumption Don't temp prinsy concumption Control temp con	- 19,376 Solid fossil fuels - 28,195 - 21,314 Solid fossil fuels - 28,195 - 21,314	26,530,595 Cristic Oil and petroleum products 750,095 11,000,092 14,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085	13-20-20 15331 28-48-500 15331 18,777,005 6,155 Gos 445-445-445-445-445-445-445-445-445-445	Non	5.082,752,762 5.331,833 5.331,833 5.331,833 5.331,833 6.22 6.331,833 6.34,001,843 6	2.41,286 10.124,845 10.124,845 10.124,845 10.124,845 10.124,845 10.124,134 10.124,134 10.124	22,253,746 26,664,340 7,965,29 7,965,29 31,637,244 7,965,29 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,5	Teceborate To Chair Chair Onto A Chair C	- 35,208 Solid fossil fuels - 10,781	272,780 - 30,500,004 - 3 Crude oil and periodeum Gas and Gas	7,244 410 6,311 6,000 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,245 7,	996 174,5 646 - 93,9 Non renewable water - 530 69,8 2294 - 116 116 - 996 Non renewable water - 530 65,8 Non renewable water - 55,5 Non renewable water - 58,1 412	# 4,943,314,000 # 37,400,466 # 12,726,74 # 18 12,72	1,068,858,858,858,858,858,858,858,858,858,8	1557.622 77.001.17 6.055.01 70.001.07 70.001.07 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000	Treasment Conta Conta Long farm primary consumption Long farm primary consumption Long farm primary consumption Long farm primary or disage modulary further or disage Controls C	Solid fossil fuels	Crude oil and petroleum products	Gas 51 2,66 Gas 1: 33,31 3 4	11.100 3.110.110	120,84 12	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	86,429 3,786,681 3007,484 5,785,785,785,785 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986 1,107,
Neutonaria (Staf Ont temp fining concumption Don't temp prinsy concumption Don't temp prinsy concumption Don't temp prinsy concumption Don't temp prinsy concumption Control temp con	- 19,376 Solid fossil fuels - 28,195 28,195 - 21,314 Solid fossil fuels	26,530,595 Cristic Oil and petroleum products 750,095 11,000,092 14,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085	13-20-20 15331 28-48-500 15331 18,777,005 6,155 Gos 445-445-445-445-445-445-445-445-445-445		5.082,752,762 5.331,833 5.331,833 5.331,833 5.331,833 6.22 6.331,833 6.34,001,843 6	2.41,286 10.124,845 10.124,845 10.124,845 10.124,845 10.124,845 10.124,134 10.124,134 10.124	22,258,746 26,684,347 7,565,29 7,565,29 7,565,29 36,627,266,29 36,157,550 36,157,550 37,267,27 2,267,27 2,267,27 3,457,550 3,4	Tecebrated Clast Salts Mid team primary consumption Mid team primary consumption Mid team primary consumption Construction Construction	- 35,208 Solid fossil fuels - 10,781 - 1,781 - 38,728 Solid fossil fuels - 1,781 - 1	272,780 - 30,500,004 - 3 Crude oil and periodeum Gas and Gas	7,244 410 6,311 6,000 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,244 6,333 7,245 7,	996 174,5 646 93,9 Non enewable evades 550 68,8 -294 - 116 - 996 996 - 37,59 Non enewable evades - 5550 68,8 - 7564 - 77,50	# 4,943,314,000 # 37,400,466 # 12,726,74 # 18 12,72	1,068,858,858,858,858,858,858,858,858,858,8	1557.627 77.001.17 6.055.07 6.055.07 70.001.07 70.001.07 70.001 70.001 1.356.021 3.356.021	Treasment Conta Conta Long farm primary consumption Long farm primary consumption Long farm primary consumption Long farm primary or disage modulary further or disage Controls C	Solid fossil fuels	Crude oil and petroleum products	Gas 51 2,66 Gas 1: 33,31 3 4	18.855 14.588.159.100 18.1505 14.588.159.100 18.11.00 2.155.121.00 18.11.00 2.255.121.00 Pannewable seringias 18.450 0.2555.121.00 Pannewable seringias 18.450 0.00 18.450 0	120,84 12	4.166,879 2 4.064,683 79 2 4.064,683 70 10 10 10 10 10 10 10 10 10 10 10 10 10	86,42 9,786,689 1807,498 1,986,398 11057,79 5,986,398 11057,79 5,986,370 11057,79 5,986,3
Nacidential Glid Data to any privacy consumption Short to any privacy consumption The state of the	- 19,376 Solid fossil fuels - 28,195	26,530,595 Cristic Oil and petroleum products 750,095 11,000,092 14,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085 24,072,085	13-77-205 0.1531 18,777-205 0.1531 18,777-205 0.1551 18,777-205 0.1552 18,64520 1.1552 18,6452	A427 228,75 1914 228,75 1914 228,75 1914 228,75 1914 228,75 1916	5.082,752,762 5.331,833 5.331,833 5.331,833 5.331,833 6.22 6.331,833 6.34,001,843 6	241,286 10,124,861 1,213,134 1,213,134 1,213,134 10,134	22,253,746 26,664,340 7,965,29 7,965,29 31,637,244 7,965,29 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,530,365 11,530 11,5	Tecebrated Tested State Mid from primary consumption Mid from primary consumption Mid from primary consumption State of the state	- 35,208 Solid fossil fuels - 10,781	272,780 - 30,500,004 - 3 Crude oil and periodeum Gas and Gas	7,244,400 6,312,500,500,500,500,500,500,500,500,500,50	996 174,5 546 - 93,6 Non renewable waters 550 60,8 2294 - 116 - 296 116 - 37,5 Non renewable waters	# 4,041,31,41,41,41,41,41,41,41,41,41,41,41,41,41	1,000,051,000 1,200,051,000 1,200,050,000 2,210,050,000 2,210,050,000 2,210,050,000 3,200,000 3,20	1557.622 77.001.17 6.055.01 70.001.07 70.001.07 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000 70.0000	Test descript Seria Jang term primary concumption Long term co	Solid fossil fuels	Crude oil and petroleum products 43,059,82 Crude oil and petroleum products - 43,059,82	Gas Sign Sign Sign Sign Sign Sign Sign Sign	### 488.200 ARRANGE AR	120,84 12	\$ 15,20,300 5 15,200,300 6 15,200,300 7 0,500,300 7 0,500,300 7 0,500,300 7 0,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 3,500 7 3,500 7 3,500 7 3,500 7 3,500	86,429 3,786,681 3007,484 5,785,785,785,785 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986,787 1,107,725 5,986 1,107,
Nacidential (field Data to one primary consumption Short to one primary consumption Consumptio	- 19,376 Solid fossil fuels - 28,195	Crude eil and perfection products 77,500 (1972) (19	13-77-205 0.1531 18,777-205 0.1531 18,777-205 0.1551 18,777-205 0.1552 18,64520 1.1552 18,6452	A427 228,75 1914 228,75 1914 228,75 1914 228,75 1914 228,75 1916	5.002,75,762,75,162,75,	241,286 10,124,861 1,213,134 1,213,134 1,213,134 10,134	22,253,746 26,663,847 7,965,29 36,627,247 7,965,29 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520 11,520,375 11,520,3	Tecebrated Tested State Mid from primary consumption Mid from primary consumption Mid from primary consumption State of the state	- 35,208 Solid fossil fuels - 10,781	273,790 39,900,004 9,900,004 Crusie oil and pertorium Cas grandusts 280,602 4,104 4,104 280,602 4,104 4,104 4,104 4,104 64,000 3,000 1,607 1,607 1,607 1,607 1,607	7,244,400 6,312,500,500,500,500,500,500,500,500,500,50	996 174,5 546 - 93,6 Non renewable waters 550 60,8 2294 - 116 - 296 116 - 37,5 Non renewable waters	# 4,041,31,41,41,41,41,41,41,41,41,41,41,41,41,41	1,000,051,000 1,200,051,000 1,200,050,000 2,210,050,000 2,210,050,000 2,210,050,000 3,200,000 3,20	1557.622 77,001.17 6,055.07 70,001.17 70,001.07 70,000 70,	Test descript Seria Jang term primary concumption Long term co	Solid fossil fuels	Crude oil and petroleum products 43,059,82 Crude oil and petroleum products - 43,059,82	Gas Sign Sign Sign Sign Sign Sign Sign Sign	### 488.200 ARRANGE AR	120,84 12	\$ 15,20,300 5 15,200,300 6 15,200,300 7 0,500,300 7 0,500,300 7 0,500,300 7 0,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 3,500 7 3,500 7 3,500 7 3,500 7 3,500	86,429 9,766,629 10,766,630 10,767,630 10,767,727 10,766,738 10,767,727 10,766,738 10,767,727 10,76
Nacionaria (Staf Onta	- 19,376 Solid fossil fuels - 28,195	Crude eil and perfection products 77,500 (1972) (19	13-77-205 0.1531 18,777-205 0.1531 18,777-205 0.1551 18,777-205 0.1552 18,64520 1.1552 18,6452	A427 228,75 1914 228,75 1914 228,75 1914 228,75 1914 228,75 1916	5.002,75,762,75,162,75,	241,286 10,124,861 1,213,134 1,213,134 1,213,134 10,134	22,253,746 26,663,847 7,965,29 36,627,247 7,965,29 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520 11,520,375 11,520,3	Tecebrated Tested State Mid from primary consumption Mid from primary consumption Mid from primary consumption State of the state	- 35,208 Solid fossil fuels - 10,781	273,790 39,900,004 9,900,004 Crusie oil and pertorium Cas grandusts 280,602 4,104 4,104 280,602 4,104 4,104 4,104 4,104 64,000 3,000 1,607 1,607 1,607 1,607 1,607	7,244,400 6,312,500,500,500,500,500,500,500,500,500,50	996 174,5 546 - 93,6 Non renewable waters 550 60,8 2294 - 116 - 296 116 - 37,5 Non renewable waters	# 4,041,31,41,41,41,41,41,41,41,41,41,41,41,41,41	1,000,051,000 1,200,051,000 1,200,050,000 2,210,050,000 2,210,050,000 2,210,050,000 3,200,000 3,20	1557.622 77,001.17 6,055.07 70,001.17 70,001.07 70,000 70,	Test descript Seria Jang term primary concumption Long term co	Solid fossil fuels	Crude oil and petroleum products 43,059,82 Crude oil and petroleum products - 43,059,82	Gas Sign Sign Sign Sign Sign Sign Sign Sign	### 488.200 ARRANGE AR	120,84 12	\$ 15,20,300 5 15,200,300 6 15,200,300 7 0,500,300 7 0,500,300 7 0,500,300 7 0,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 3,500 7 3,500 7 3,500 7 3,500 7 3,500	86,429 9,766,629 10,766,630 10,767,630 10,767,727 10,766,738 10,767,727 10,766,738 10,767,727 10,76
Nacionaria (Staf Onta	- 19,376 Solid fossil fuels - 28,195	Crude eil and perfection products 77,500 (1972) (19	13-77-205 0.1531 18,777-205 0.1531 18,777-205 0.1551 18,777-205 0.1552 18,64520 1.1552 18,6452	A427 228,75 1914 228,75 1914 228,75 1914 228,75 1914 228,75 1916	5.002,75,762,75,162,75,	241,286 10,124,861 1,213,134 1,213,134 1,213,134 10,134	22,253,746 26,663,847 7,965,29 36,627,247 7,965,29 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520,365 11,520 11,520,375 11,520,3	Tecebrated Tested State Mid from primary consumption Mid from primary consumption Mid from primary consumption State of the state	- 35,208 Solid fossil fuels - 10,781	273,790 39,900,004 9,900,004 Crusie oil and pertorium Cas grandusts 280,602 4,104 4,104 280,602 4,104 4,104 4,104 4,104 64,000 3,000 1,607 1,607 1,607 1,607 1,607	7,244,400 6,312,500,500,500,500,500,500,500,500,500,50	996 174,5 546 - 93,6 Non renewable waters 550 60,8 2294 - 116 - 296 116 - 37,5 Non renewable waters	# 4,041,31,41,41,41,41,41,41,41,41,41,41,41,41,41	1,000,051,000 1,200,051,000 1,200,050,000 2,210,050,000 2,210,050,000 2,210,050,000 3,200,000 3,20	1557.622 77,001.17 6,055.07 70,001.17 70,001.07 70,000 70,	Test descript Seria Jang term primary concumption Long term co	Solid fossil fuels	Crude oil and petroleum products 43,059,82 Crude oil and petroleum products - 43,059,82	Gas Sign Sign Sign Sign Sign Sign Sign Sign	### 488.200 ARRANGE AR	120,84 12	\$ 15,20,300 5 15,200,300 6 15,200,300 7 0,500,300 7 0,500,300 7 0,500,300 7 0,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 2,500,300 7 3,500 7 3,500 7 3,500 7 3,500 7 3,500	86,429 9,766,629 10,766,630 10,767,630 10,767,727 10,766,738 10,767,727 10,766,738 10,767,727 10,76



GENERAL VISUALS



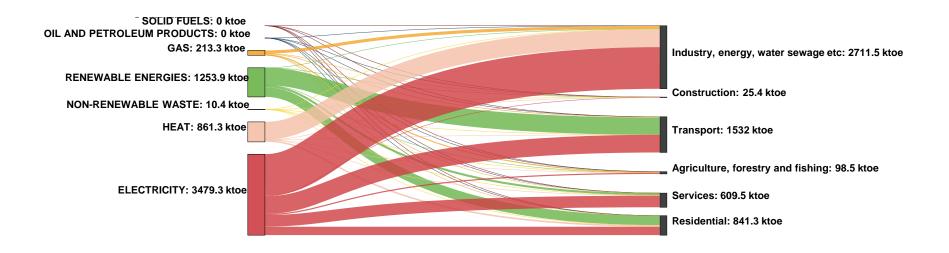




INTEGRATED SANKEY VISUALS



final energy demand | primary energy | CO2 emissions | fossil fuels shift





THANK YOU!





EUROPÄISCHES ZENTRUM FÜR ERNEUERBARE ENERGIE GÜSSING GMBH

Eng. Giulio Cerino Abdin Politecnico di Torino | DENERG

www.polito.it

giulio.cerino@polito.it

+39 011.090.4529

Manfred Hotwagner European Center for Renewable Energy Güssing

www.eee-info.net

m.hotwagner@eee-info.net

+43 677 63 03 4704

https://twitter.com/PROSPECT_2030

https://www.linkedin.com/company/interreg-prospect2030/



 \searrow

28