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CONFERENZA
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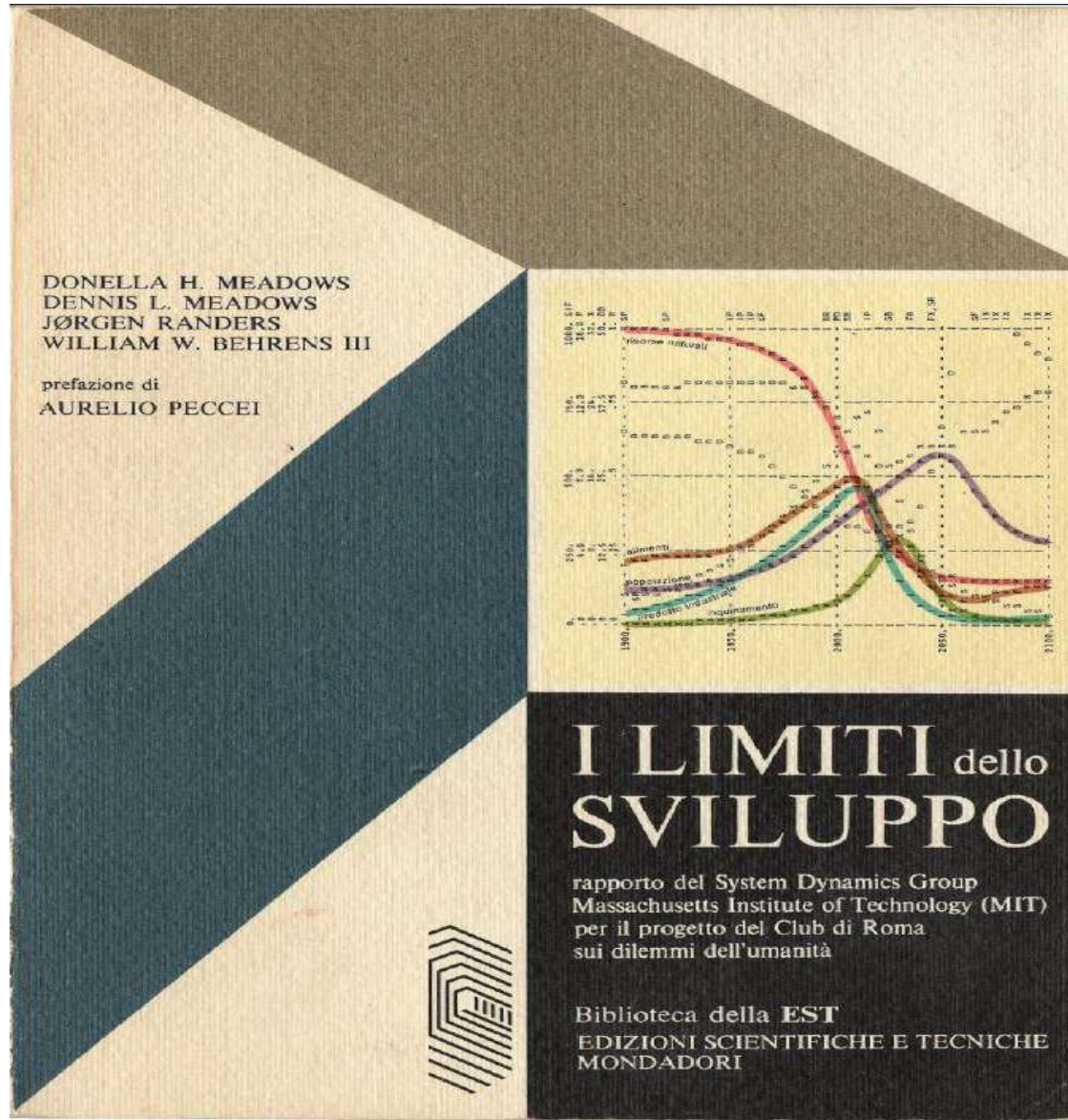
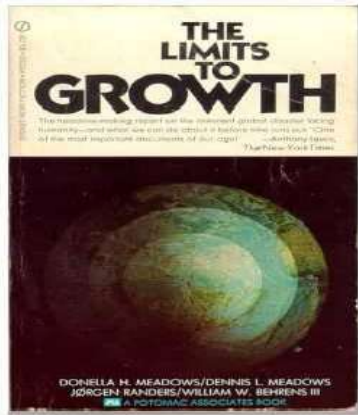
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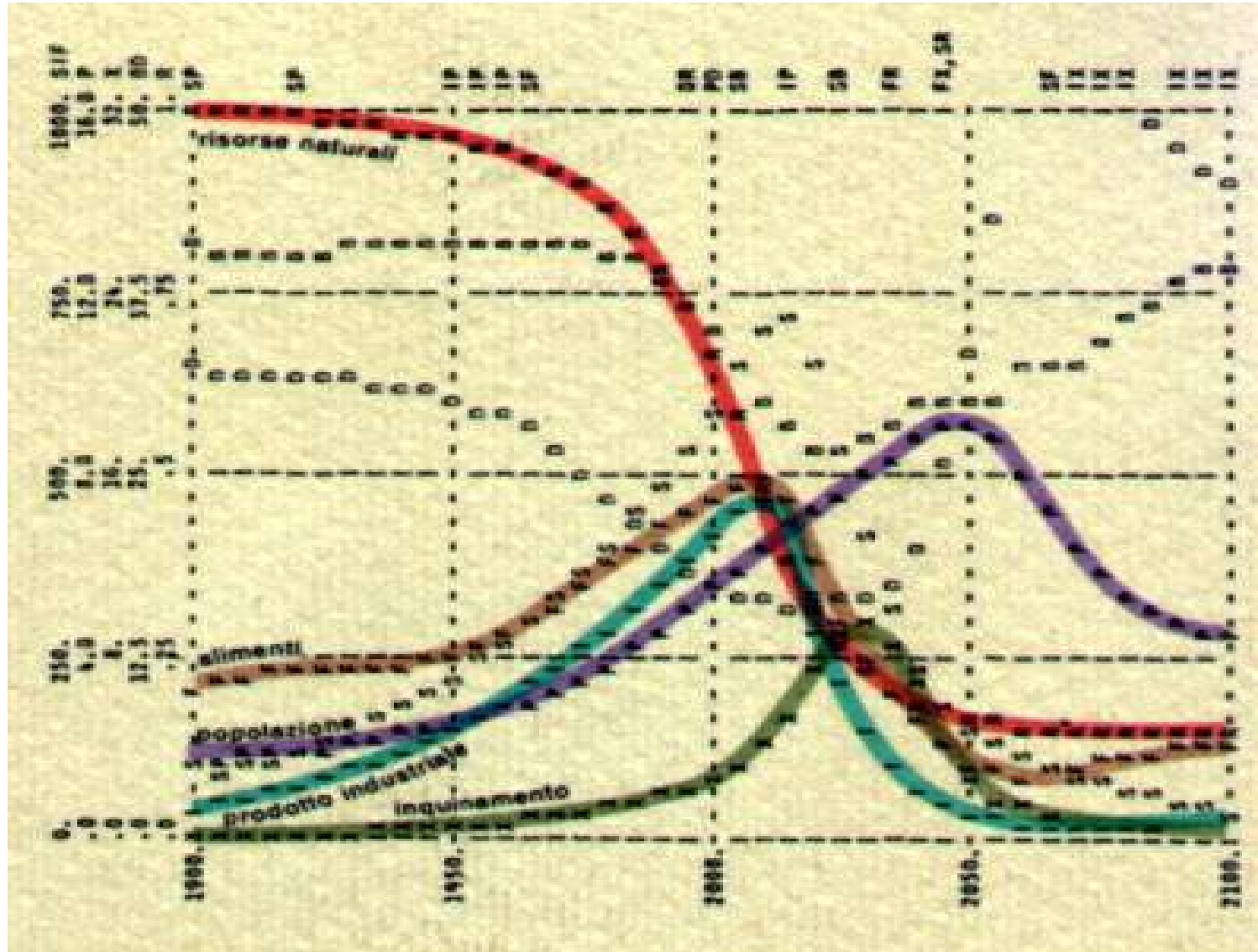
“Elettrificazione della mobilità e sostenibilità nella visione del Club di Roma”

Prof. Ugo Bardi – Club di Roma

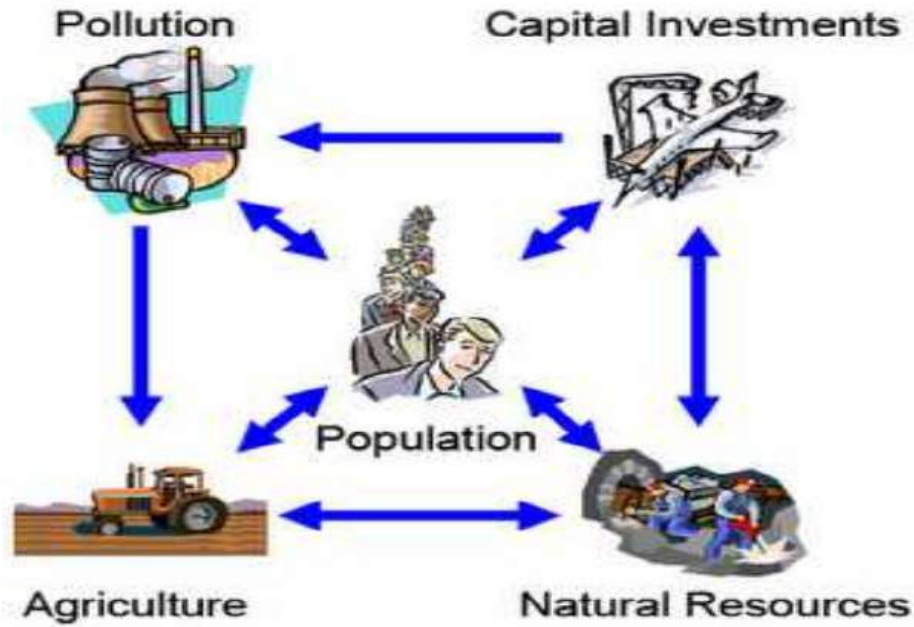
1972



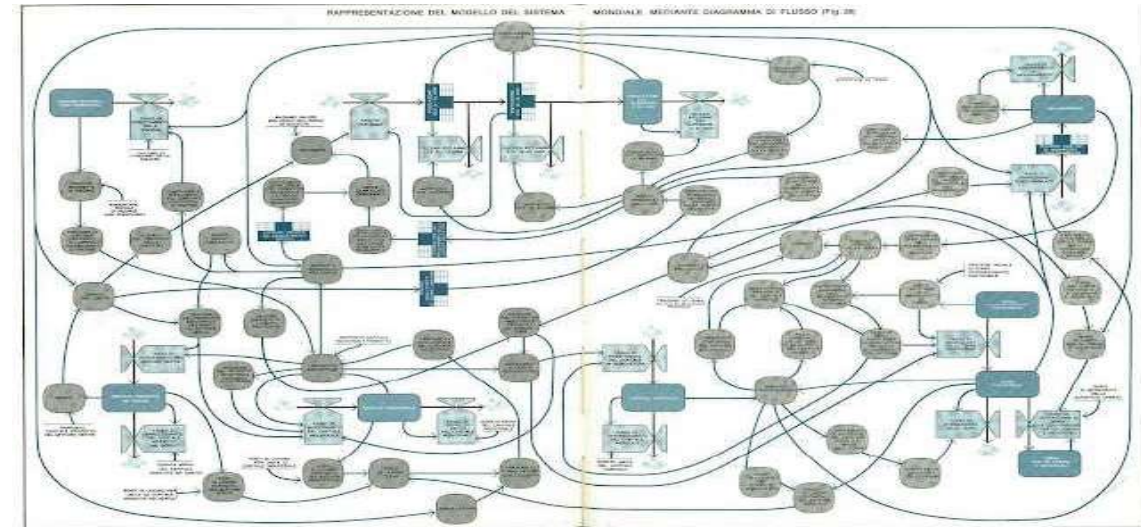
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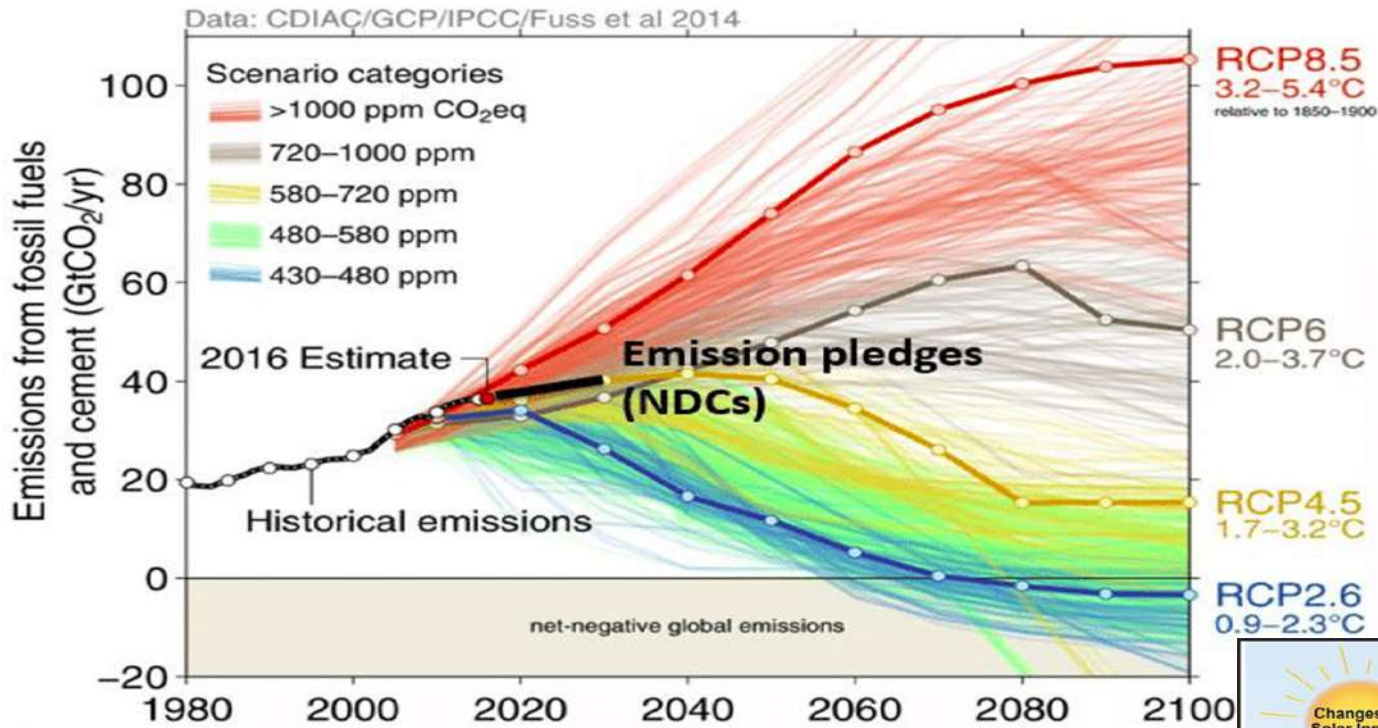


The World3 Model (1972)

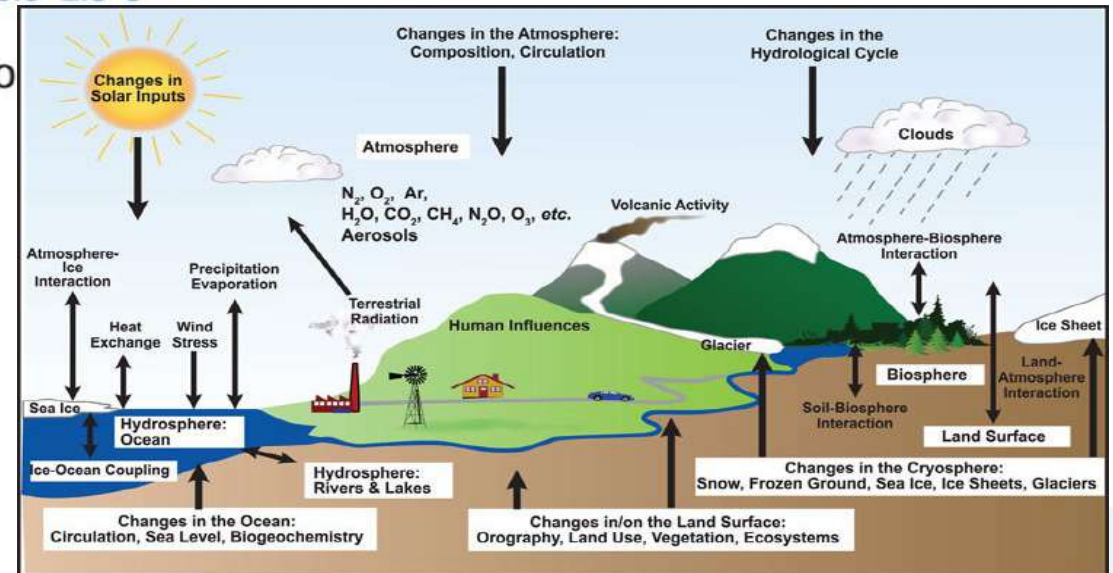


Myrtveit 2005



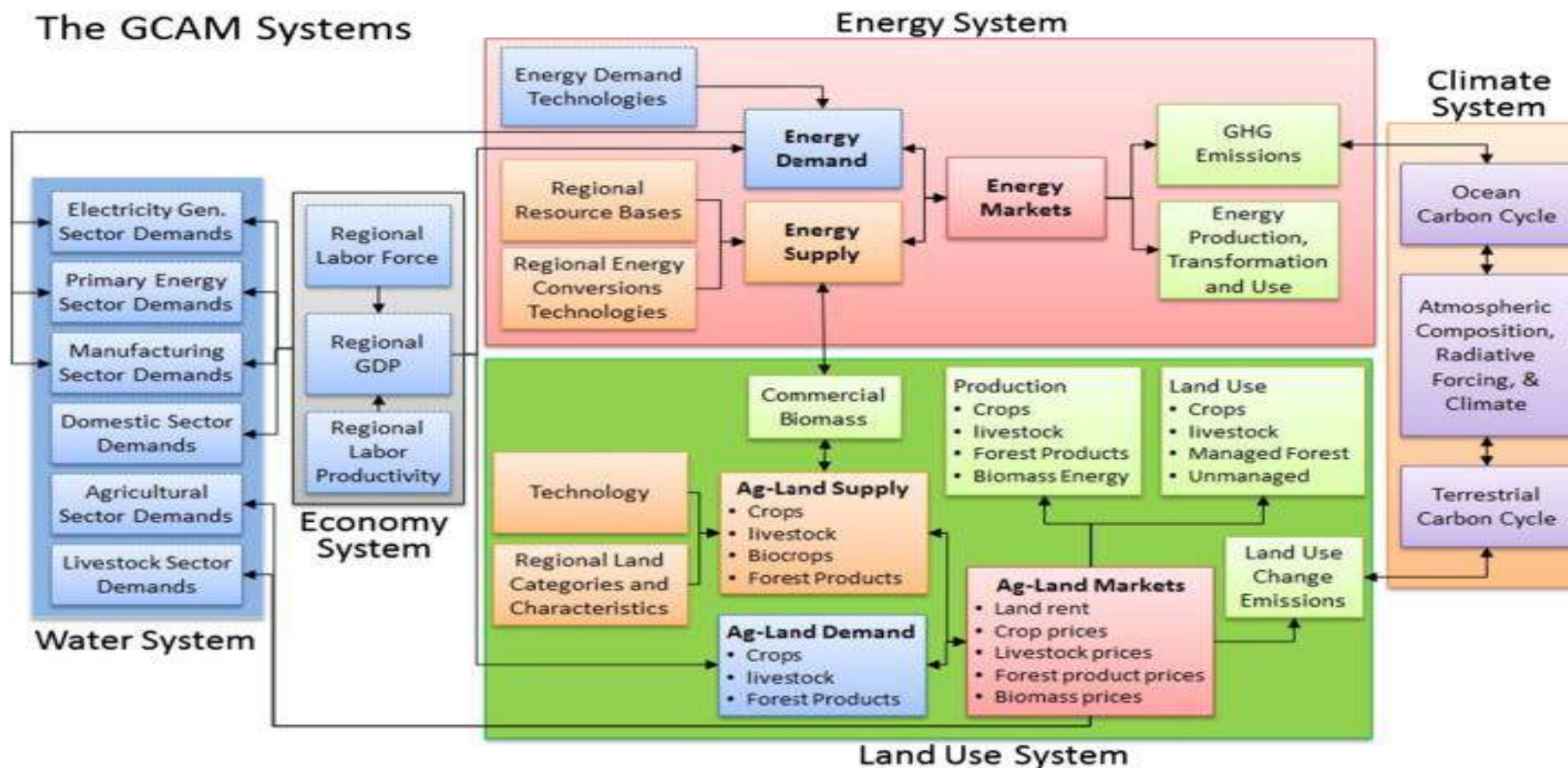


GCM – General Circulation Models



IAM – Integrated Assessment Models

The GCAM Systems



MEDEAS

MODELING THE RENEWABLE ENERGY TRANSITION IN EUROPE

MODEL

DATABASE

FORUM

A NEW OPEN-SOURCE ENERGY MODEL TO GUIDE THE TRANSITION TO A LOW CARBON EUROPEAN SOCIO-ECONOMY.

NEWS & EVENTS

Scientific Publication "Dynamic Energy Return on Energy Investment (EROI) and material requirements in scenarios of global transition to renewable energies" based on MEDEAS Project Results

TUE, 10 SEPTEMBER

Iñigo Capellán-Pérez, Carlos de Castro and Luis Javier Miguel, MEDEAS partners from the University of Valladolid (UVa) have just published ...

DOCUMENTARY

IN THE SPOTLIGHT

Publications

Scientific Publication "Dynamic Energy Return on Energy Investment (EROI) and material requirements in scenarios of global transition to renewable energies" based on MEDEAS Project Results

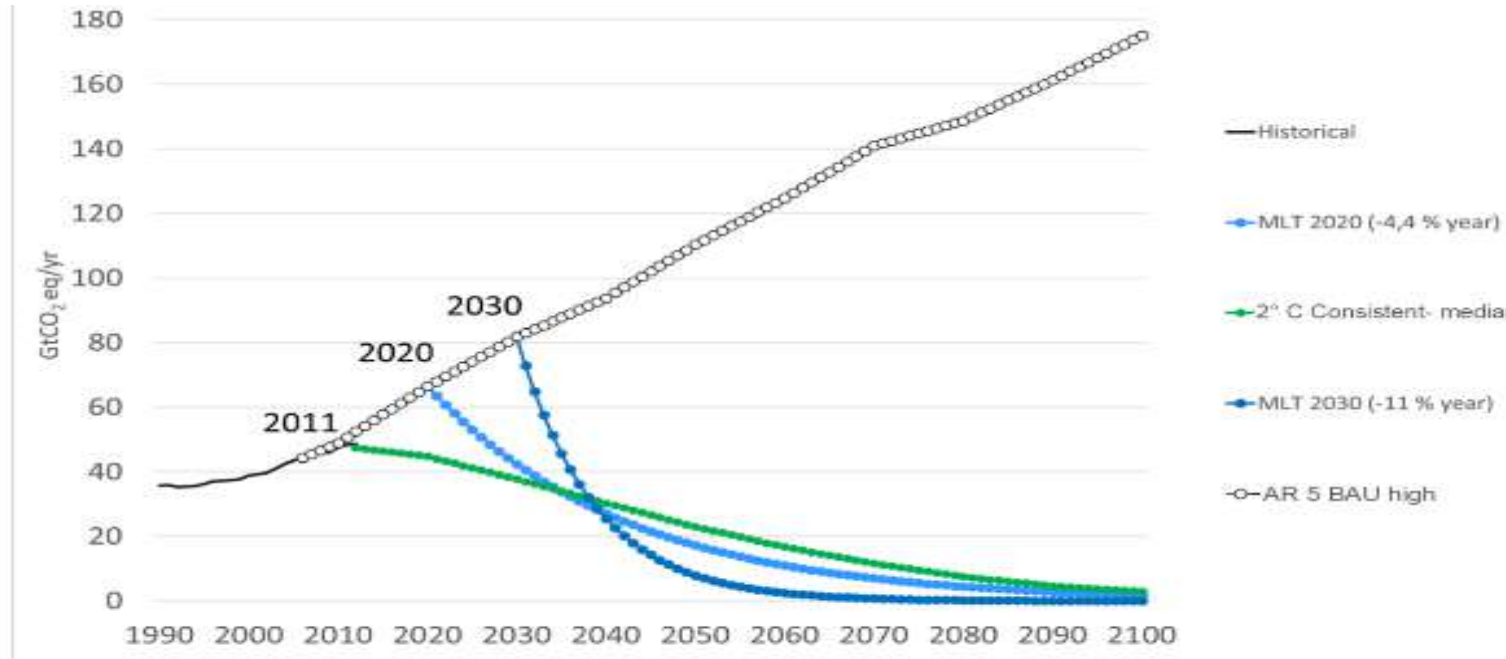
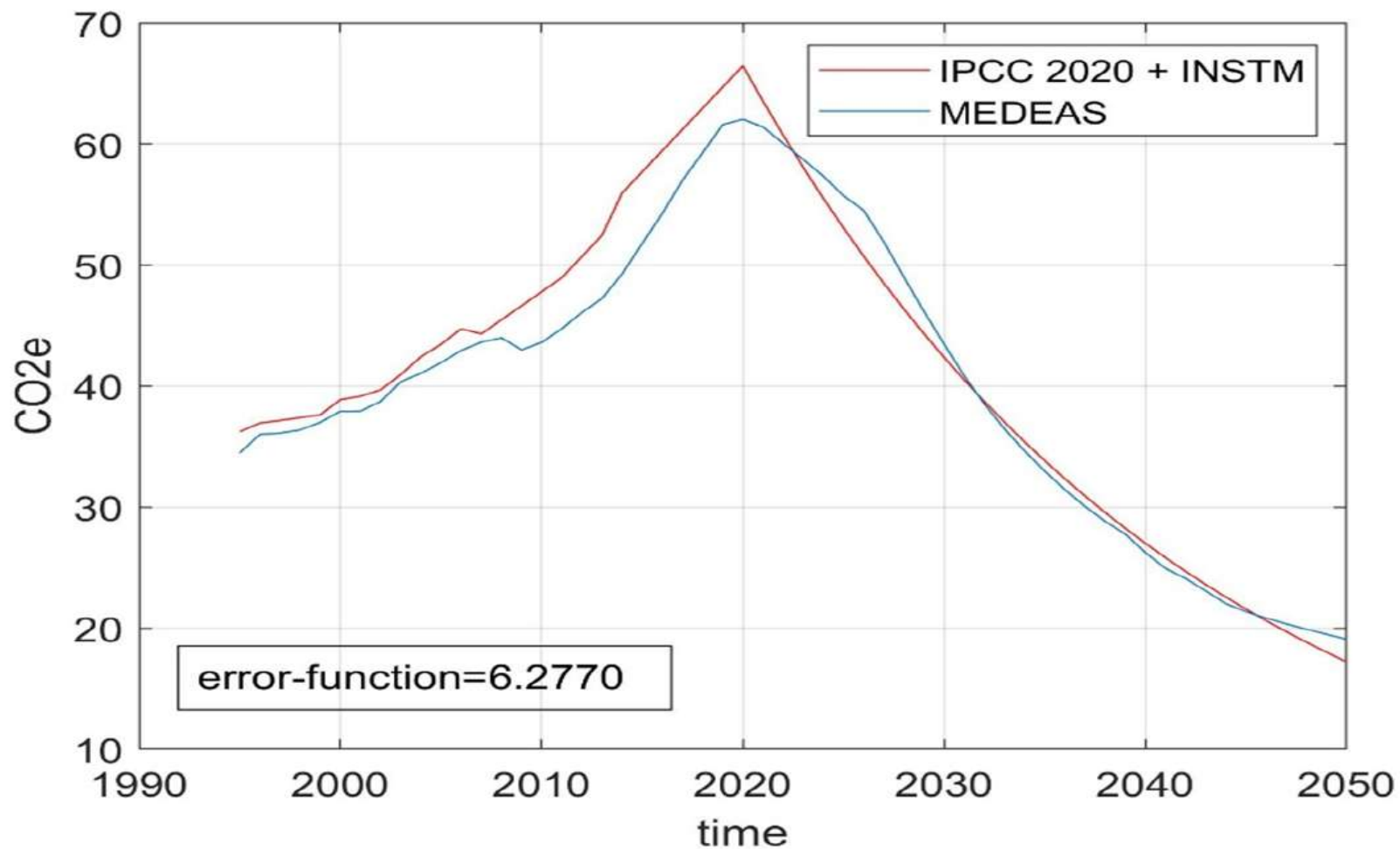


Figure 1- Global emission scenarios until 2100. Historic trend (black line), BAU (black dotted line) and 2°C consistent (green dotted line) curves are from Climate Action Tracker database. The area under the green line is equivalent to a world carbon budget, 1949 GtCO_{2eq}. Light blue and blue dotted curves are respectively the 2020 and the 2030 scenarios obtained with exponential decay at constant rates (-4,4 %/year in 2020; -11%/year 2030) with the constraint that the area under of each of those curves is equal to the value of the green one (1949 GtCO_{2eq})

Perissi, Falsini, Bardi, Natalini, Green,
Jones, Solé, in press

Simulations using the MEDEAS model (2019 – in press)

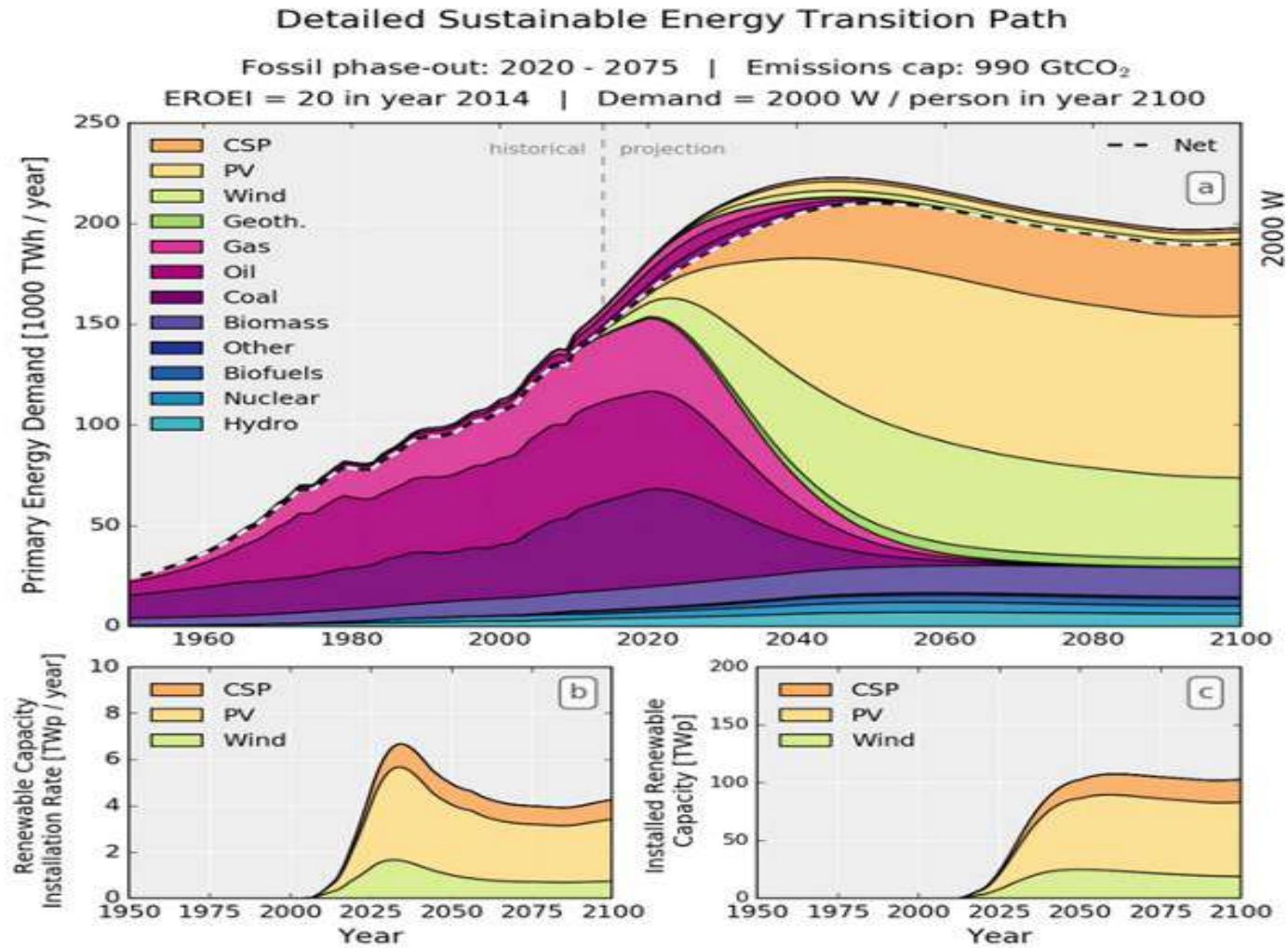


Input parameters MEDEAS run

Parameters	High	Median	Low
hydro growth	10%	20%	25%
<u>geot-elec</u> growth	4,8%	4,8%	4,8%
<u>solid bioE-elec</u> growth	14,4%	14,4%	14,4%
oceanic	15%	15%	15%
onshore wind	20%	20%	20%
wind offshore	20%	20%	20%
solar <u>PV (Photovoltaic)</u>	8%	8%	8%
<u>biofuels</u> 2gen	8%	8%	8%
<u>biofuels</u> 3gen	8%	8%	8%
<u>bioE</u> residues for heat+ <u>elec</u>	8%	8%	8%
<u>cellulosic biofuels</u>	8%	8%	8%
waste change	0,04436	0,04436	0,04436
<u>BEV</u> (Battery Electric Vehicle) growth	10%	20%	25%
<u>HEV</u> (Hybrid Electric Vehicle) growth	10%	20%	25%
<u>NGV</u> (Natural Gas Vehicle) growth	5%	5%	10%
<u>PHS</u> (Pumped Hydro Storage)	10%	20%	25%
<u>CSP</u> (Concentrated Solar Power)	10%	20%	25%
solar for heat	10%	20%	25%
geothermal for heat	10%	20%	25%
solid <u>bioE</u> for heat	10%	20%	25%

Optimized parameters – Medeas Run

Parameters	Optimized values (Figure 10)	Range for the optimization
P hydro growth	30,3%	0 - 50 %
P geot-elec growth	29,2%	0 - 50 %
P solid bioE-elec growth	17,4%	0 - 50 %
P oceanic	24%	0 - 50 %
P onshore wind	21%	0 - 50 %
P wind offshore	9%	0 - 50 %
P solar PV (Photovoltaic)	45%	0 - 50 %
P biofuels 2gen	15,0%	0 - 50 %
P biofuels 3gen	27,0%	0 - 50 %
P bioE residues for heat+elec	16,0%	0 - 50 %
P cellulosic biofuels	33%	0 - 50 %
P waste change	0,025465277	0 - 0,1
P BEV (Battery Electric Vehicle) growth	28%	0 - 50 %
P HEV (Hybrid Electric Vehicle) growth	34%	0 - 50 %
P NGV (Natural Gas Vehicle) growth	8%	0 - 50 %
P PHS (Pumped Hydro Storage)	20,0%	0 - 50 %
P CSP (Concentrated Solar Power)	41%	0 - 50 %
P solar for heat	29,6%	0 - 50 %
P geothermal for heat	32,2%	0 - 50 %
P solid bioE for heat	14,3%	0 - 50 %
Policy electric household 4wheeler vehicle Tfin	0,52420319	0 - 1
Policy hybrid household 4w vehicle Tfin	0,309401608	0 - 1
Policy gas household vehicle 4w Tfin	0,031106111	0 - 1
Policy electric 2wheeler h. Tfin	0,655017852	0 - 1
Policy change to 2wheeler h. Tfin	0,597248823	0 - 1



Sgouridis, Csala, Bardi, 2016

The Club of Rome Climate Emergency Plan calls for 10 priority actions:

CLIMATE EMERGENCY PLAN | THE CLUB OF ROME
www.clubofrome.org #ClimateEmergencyPlan

Call to Action #1

Halt fossil fuel expansion and fossil fuel subsidies by 2020

No new investments in coal, oil and gas exploration and development after 2020 and a phase-out of the existing fossil fuel industry by 2050. Phase-out of fossil fuel subsidies by 2020.



CLIMATE EMERGENCY PLAN | THE CLUB OF ROME
www.clubofrome.org #ClimateEmergencyPlan

Call to Action #2

Triple annual investments in renewable energy, energy efficiency and low carbon technologies for high emitting sectors before 2025

Give priority to developing countries to avoid lock-in to the carbon economy.



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Viaggiare elettrico

Uno sguardo sulla mobilità del futuro

Ugo Bardi



LUCE
edizioni

IlFattoQuotidiano.it / BLOG di Ugo Bardi

View Market Reports 2018 - Get Insight on Your Industry

Get the Latest Market Reports Available On More Than 350 Industries reportlinker.com

Veicoli elettrici, più posti di lavoro e meno inquinamento. In Italia però c'è chi non li vuole



Ambiente & Veleni | 1 ottobre 2018

COMMENTI (318)

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t

G+

Più informazioni su: [Auto Elettriche](#), [Petrolio](#)



Ugo Bardi

Si sa che l'Italia è un Paese in ritardo in quello dei veicoli elettrici. Le statistiche parlano chiaro, [siamo il fanalino di coda](#) [tutti i parametri](#): numero di veicoli elet

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26 27 28 SETTEMBRE 2019

Palazzo Lombardia

MILANO

NALE
DELLA MOBILITÀ ELETTRICA



Abolire il TFR

22 ore fa

Le auto elettriche servono a far rottamare le macchine vecchie che funzionano e che sarebbe molto ecologico riparare.

Servono a farci spendere, come succede regolarmente con i cambi di direttive con l'inquinamento da decenni.



Beppeia

un giorno fa

le auto elettriche spostano il problema dalla CO2 da un posto all' altro, non lo risolvono



Daniele Barni

L'auto elettrica è una bufala: in Italia ricaviamo l'energia elettrica dal carbone e dal gas, quindi il problema non cambierà di una virgola. Anzi, si aggiungerà un problema che tra pochi anni diventerà un'emergenza: come smaltiremo miliardi di batterie radioattive?



ElCapitanDeNoartri

2 giorni fa -

Non toccate le auto elettriche al sig.Bardi.

Dovessero anche inventare un processo simile alla fotosintesi, capace di chiudere il ciclo della CO2 e trasformare i fossili in un vettore energetico di energia solare (o meglio, già lo è, ma ci serve un processo più efficiente) lui continuerebbe a sostenere l'elettrico.

L'elettrico è più di un mezzo di trasporto. E' una fede.

Aderite alla Chiesa Elettrica. In principio era il buio, poi arrivò l'Enel, e luce fu!

Non prima di aver inventato la bolletta, però.

Citroen Ax elettrica – 1998



Ramses – veicolo agricolo elettrico, 2009



Oxygen Cargo
Scooter - 2012



Tesla
2019

Www.cassandralegacy.blogspot.com

A banner for MEDEAS (Modeling the Renewable Energy Transition in Europe). The background shows a landscape with solar panels in the foreground and wind turbines in the distance under a blue sky. The MEDEAS logo, consisting of three overlapping triangles in blue, green, and yellow, is in the top left. The text 'MEDEAS' is in large white letters, with 'MODELING THE RENEWABLE ENERGY TRANSITION IN EUROPE' in smaller white letters below it. The main headline reads 'A NEW OPEN-SOURCE ENERGY MODEL TO GUIDE THE TRANSITION TO A LOW CARBON EUROPEAN SOCIO-ECONOMY.' Below this, there are two sections: 'NEWS & EVENTS' and 'IN THE SPOTLIGHT'.

MEDEAS
MODELING THE RENEWABLE ENERGY TRANSITION IN EUROPE

A NEW OPEN-SOURCE ENERGY MODEL TO GUIDE THE TRANSITION TO A LOW CARBON EUROPEAN SOCIO-ECONOMY.

NEWS & EVENTS

MEDEAS General Assembly in Florence
TUE, 20 FEBRUARY
The second MEDEAS General Assembly was organized between 5 and 9 February in Florence, Italy by the National Interuniversity Consortium of ...

IN THE SPOTLIGHT

Publications
Transportation in a 100% renewable energy system



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