

International summer school 2012,
Graz University of Technology.
Societal Aspects of Energy in Europe

Transition to Renewable Energy Systems and the Need for Innovative Democracy

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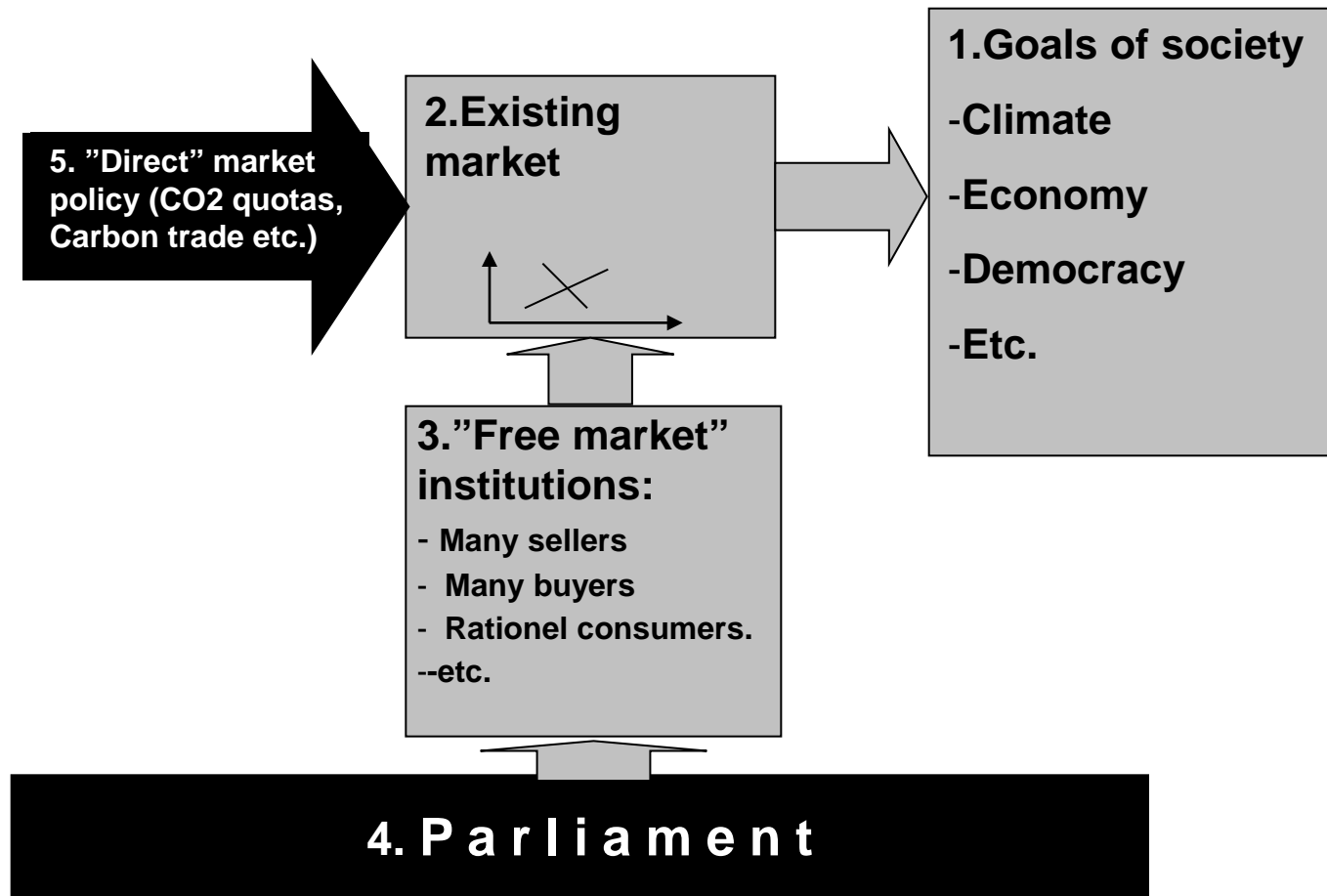
I. The need for concrete institutional economics/innovative democracy

1. How to understand political economy

From Neo-classical to Innovative Democracy

(From market society to market economy)

Neoclassical Economy

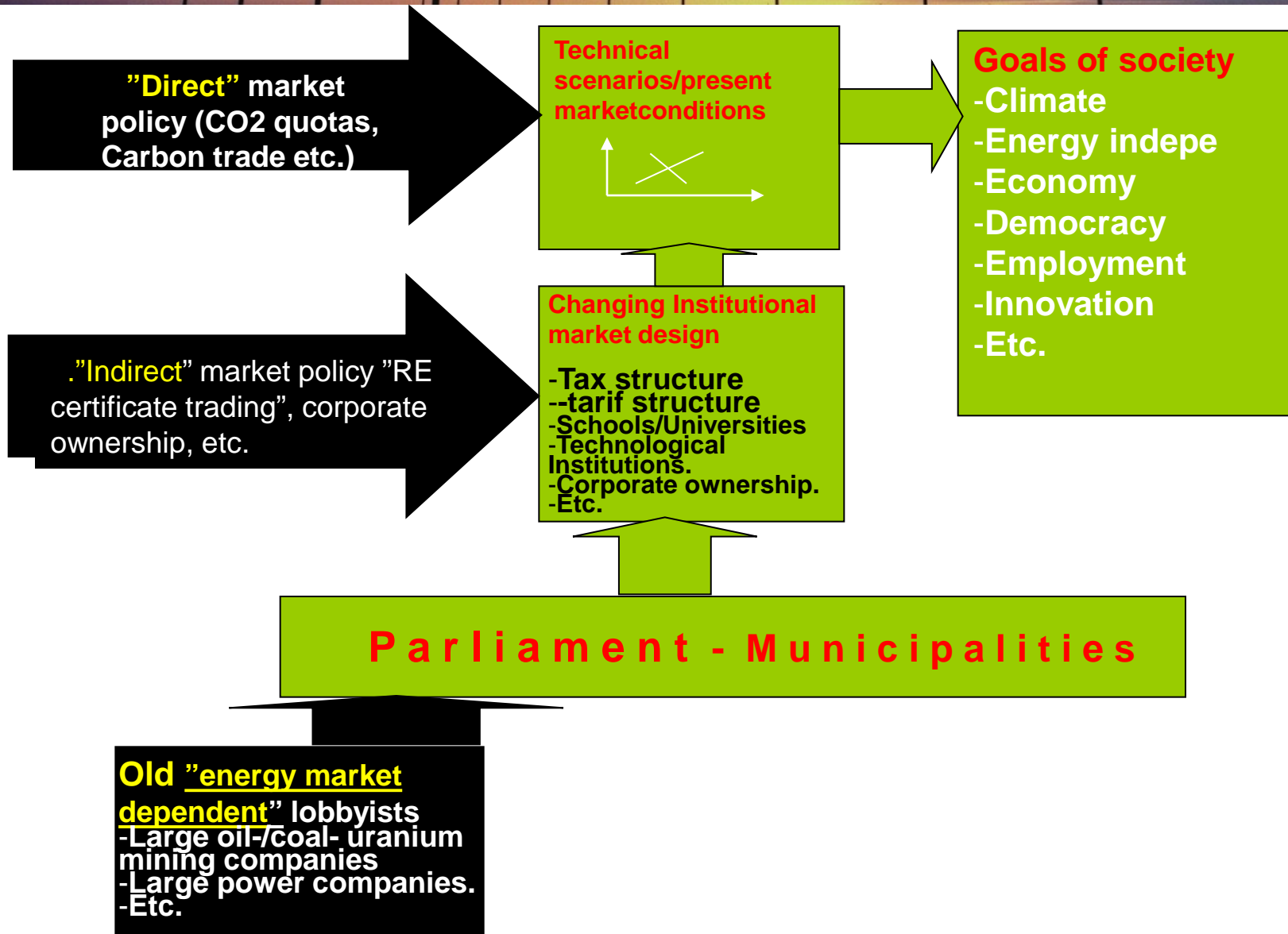


Economic understanding and assumptions behind calculations.

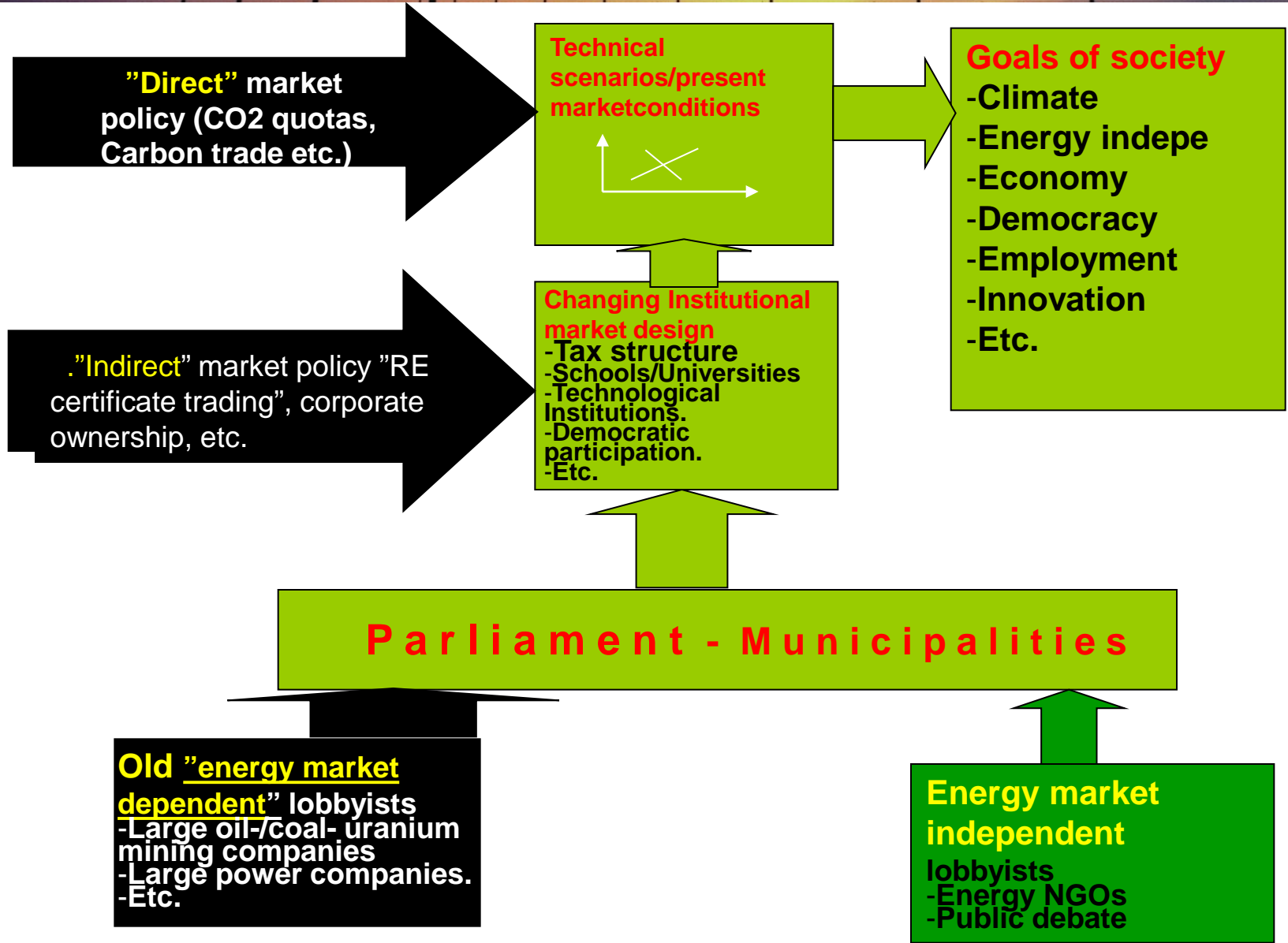
If you, like the Neo-classical economist, believe/assume that the cost and prices and institutional rules of the games are just optimal as they are today, you would:

- a. Believe, that all politically induced changes gives extra costs, as the present situation in optimal.
- b. Believe, that you don't have to change societal rules of the game (institutions),
- c. That society can wait until the “market forces” introduces cleaner technologies.
- d. That the only change you have to induce is to INTERNALIZE THE EXTERNAL COSTS IN THE MARKETPRICES.

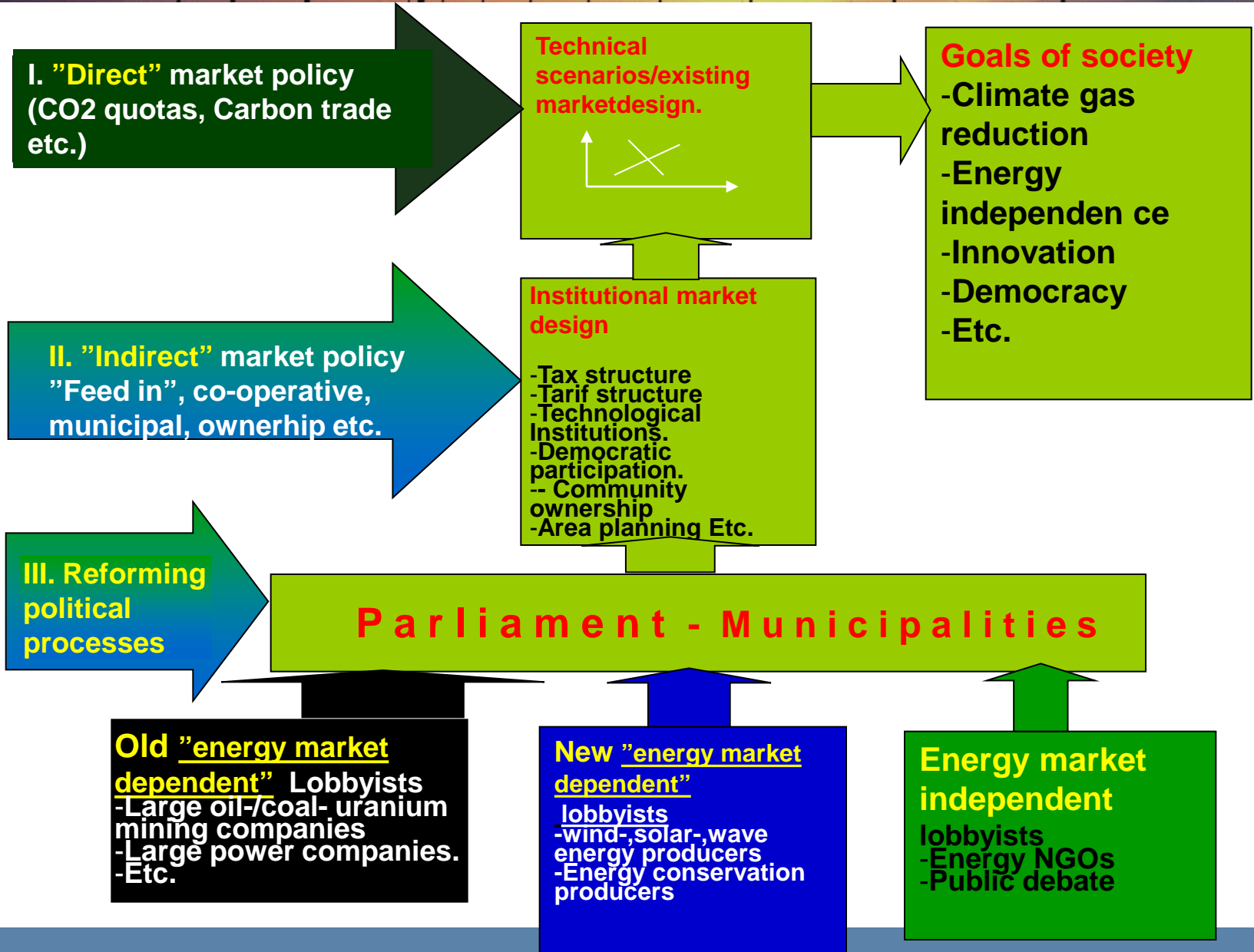
Institutional economists would not have these believes a,b,c., but also include d. in their analysis.



Concrete institutional economy/Innovative democracy



Concrete institutional economy/Innovative democracy



Two perceptions of economics and technological change

The Neo-classical understanding

- The market is functioning as a free market
- The economy is in optimum. We are in the best of all worlds.
- There are no “free meals” - any change has societal costs.

This understanding usually is the base for present versions of cost benefit- and cost effectiveness analysis

The Innovative democracy/Institutional Economy- understanding

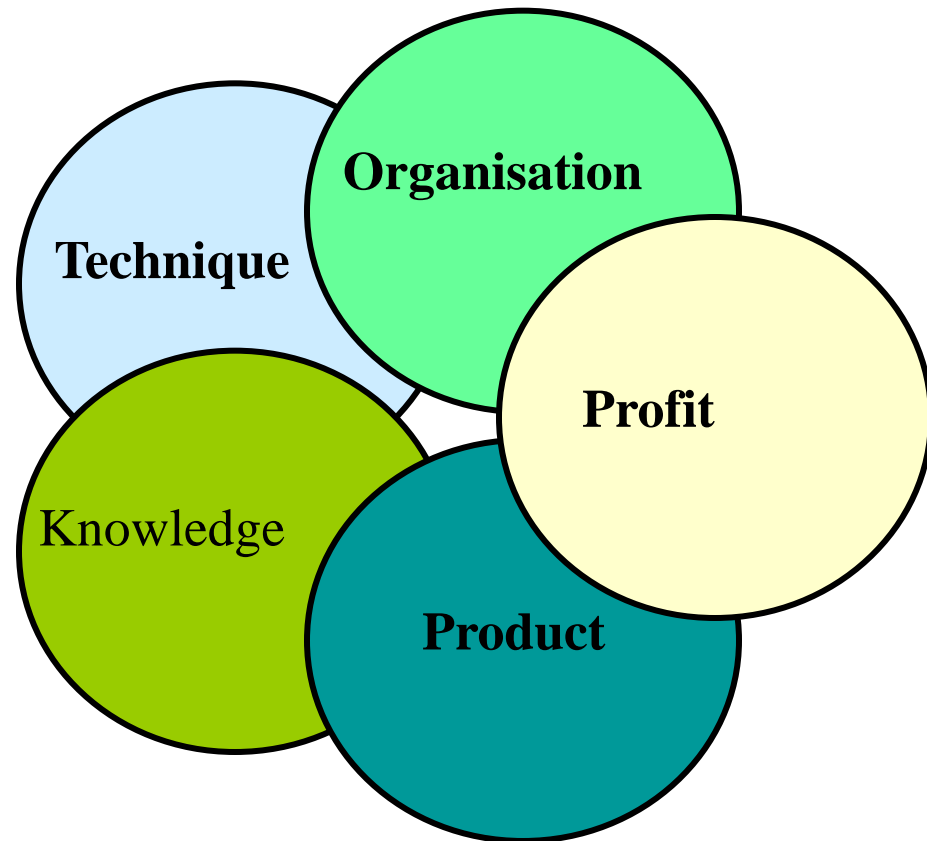
- The market is a human made institutional construction. And different from country to country.
- The economy therefore is not pr. definition in optimum.
- Therefore there are “free meals” –it is possible to find better economic situations than the present.
- The political process should include influence by both economic dependent and economically independent lobbyists.

This understanding is the base for how innovative feasibility studies should be made. And only this approach makes it possible to establish a change in energy policy towards 100% renewable energy and conservation (See Niels Meyers presentation tomorrow).

2. Technological change and Innovative Democracy

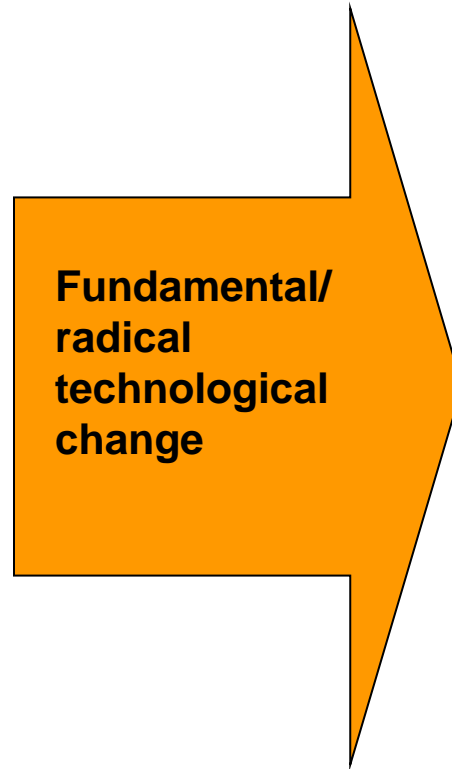
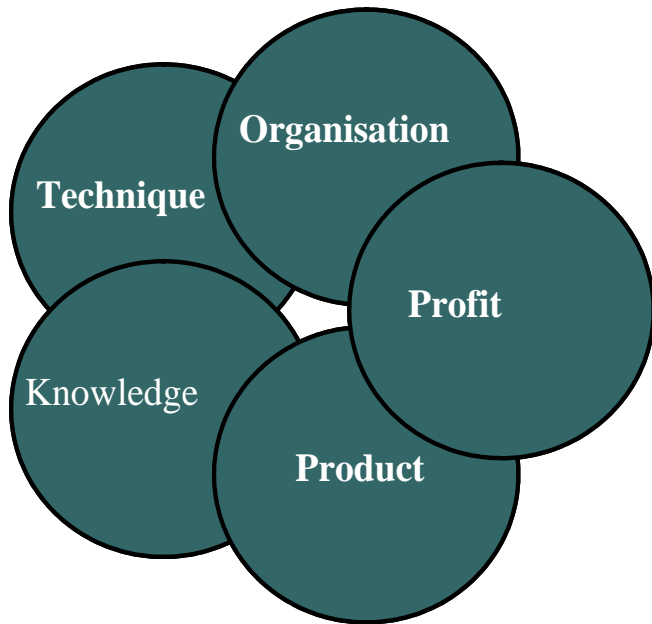
"Radical technological changes", is here defined as a change where **more than one** out of five circles/technology components are changed

Technology =

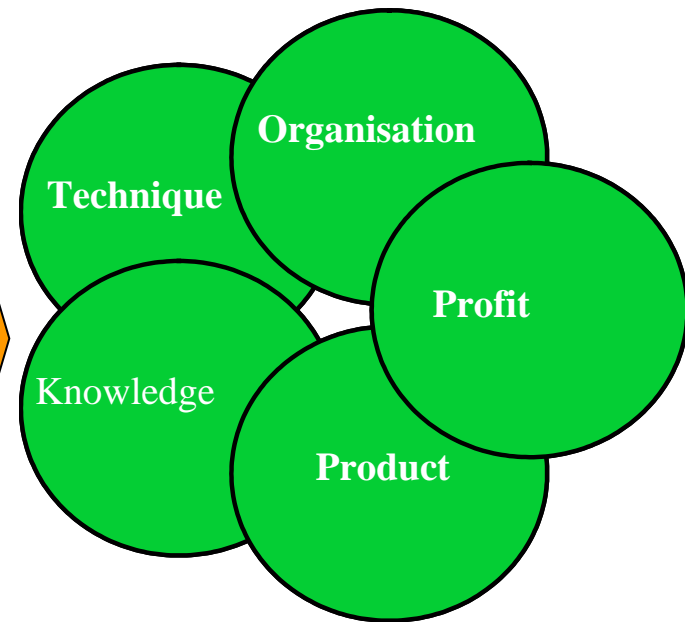


From fossil fuels to Renewable Energy Systems is a radical technological change

Fossil fuel/uranium



Renewable Energy and Conservation



We are dealing with a very difficult change

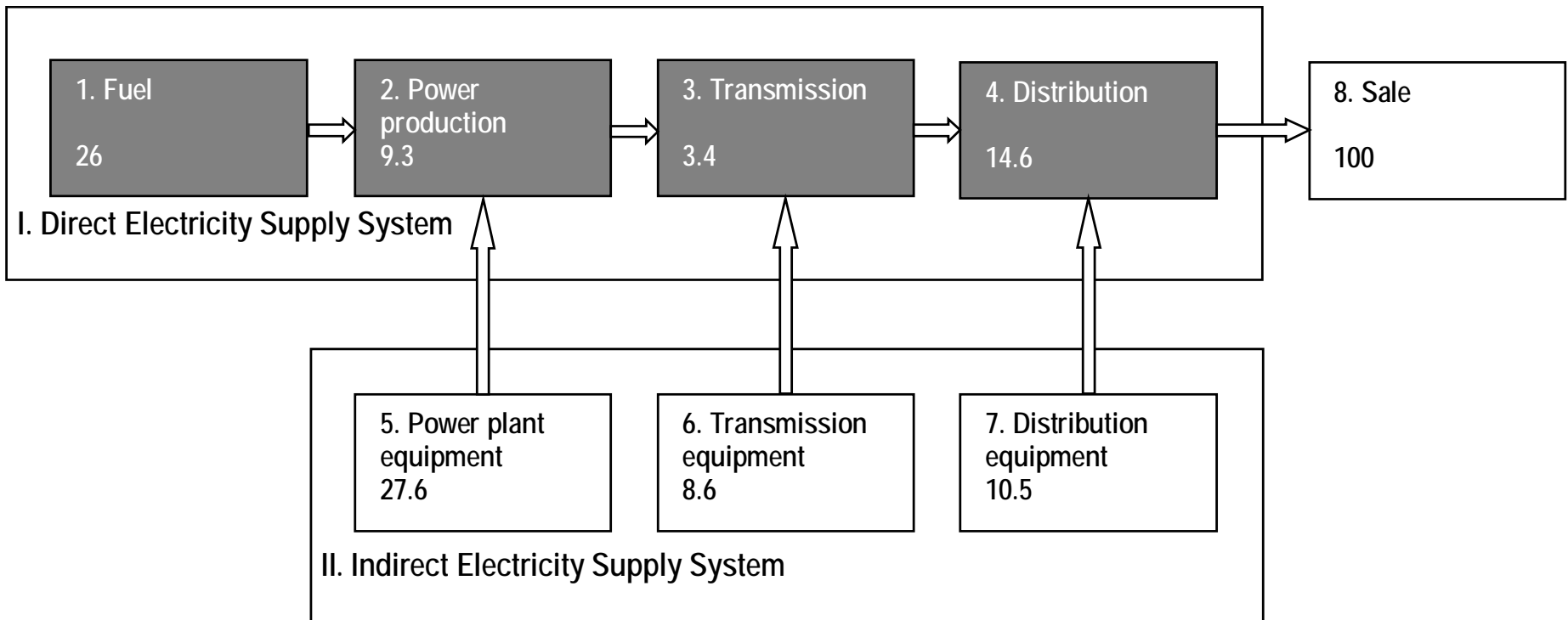
Difficult with regard to:

- Need for new technology,
- Need for new organisations,
- Need for new knowledge,
- New and so far weak actors should earn profit,
- Old and politically strong actors should lose profit

As a consequence there is a need for a detailed institutional analysis, which is different from country to country.

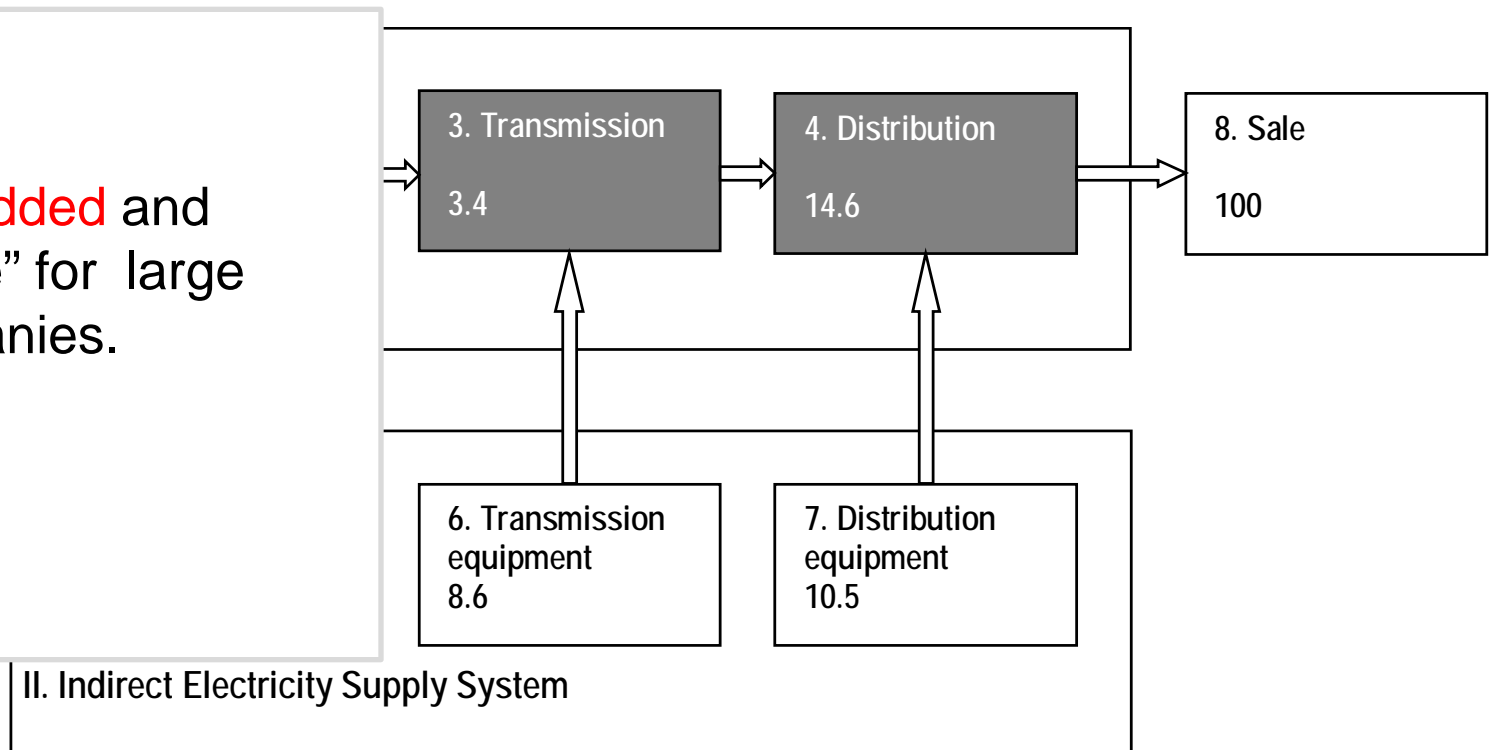
And a difficult and conflict loaden change can be expected.

The OLD fossil fuel based system: Where the money goes - or the value-added distribution in a coal-fired electricity system.

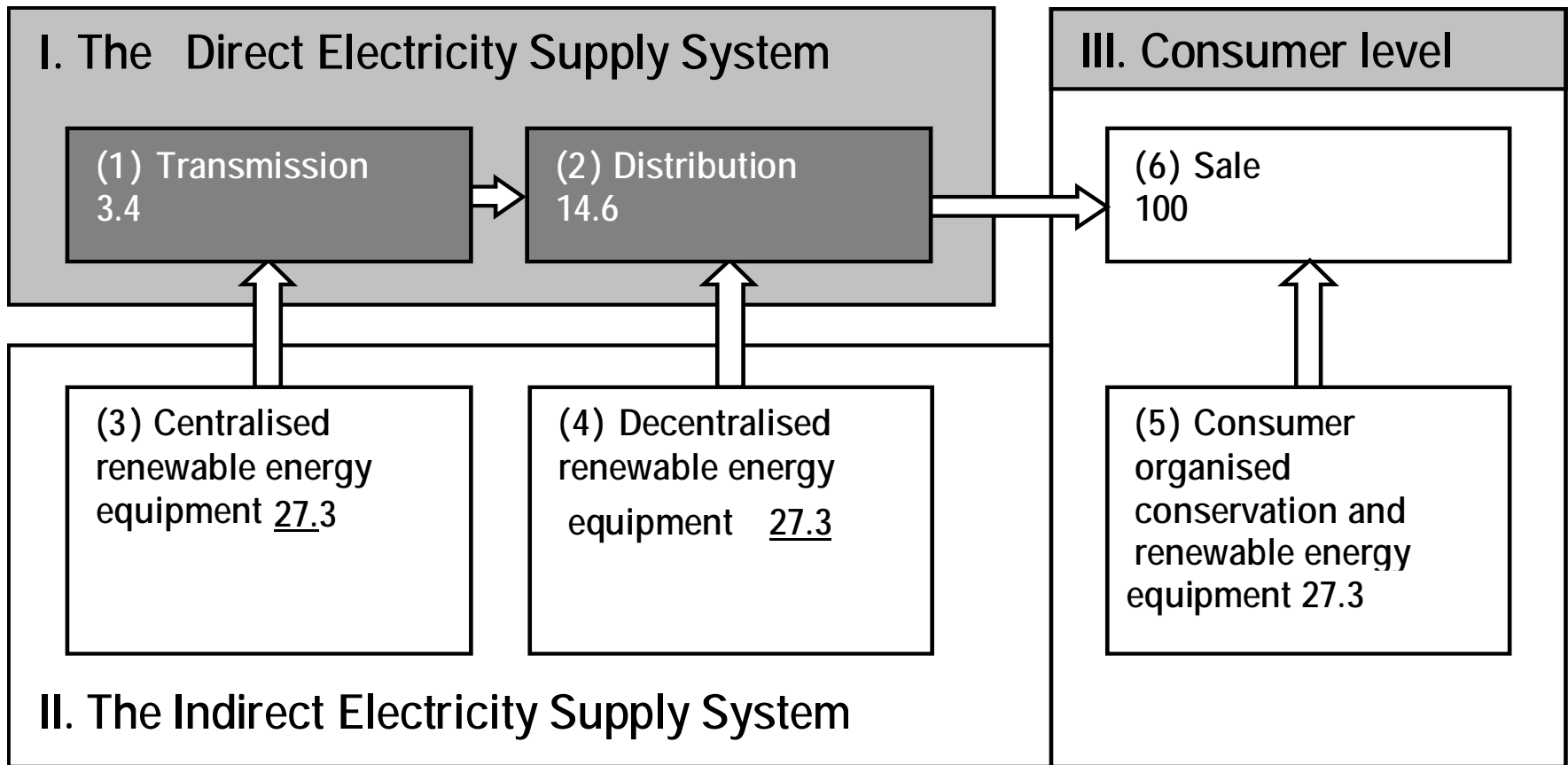


Lost value-added when changing from a fossil fuel to a renewable energy based system.

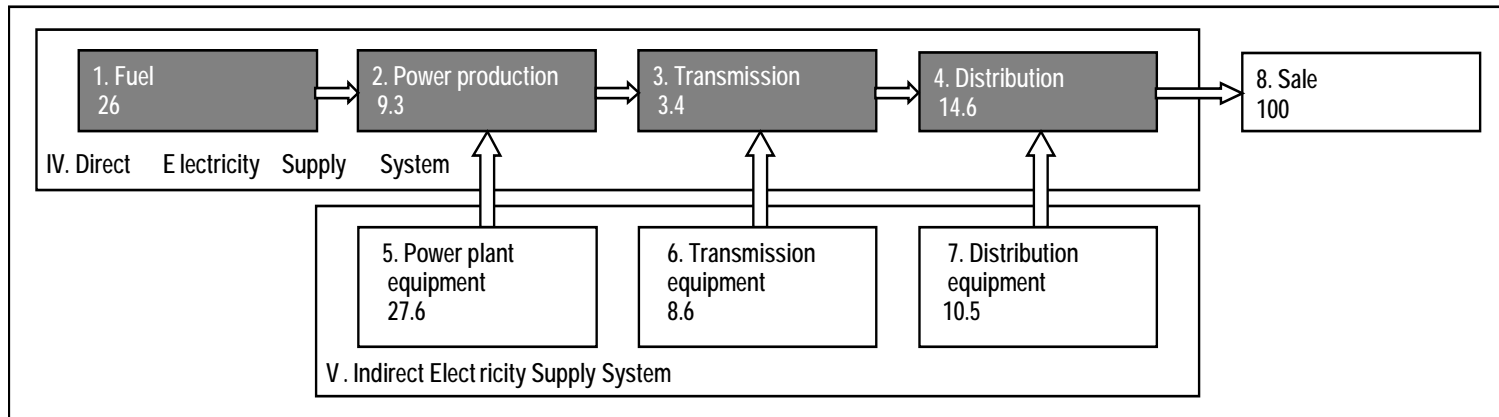
Lost value added and "raison d`etre" for large power companies.



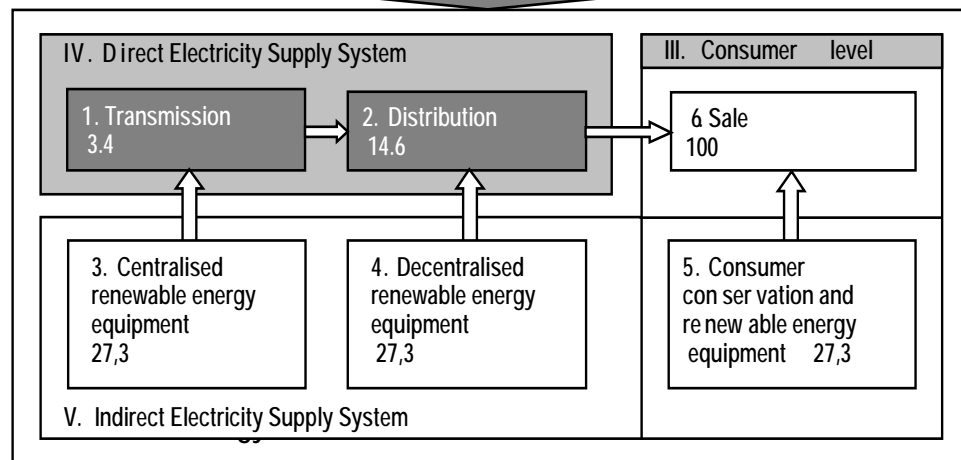
The new integrative renewable energy based system: Where the money goes, in the coming renewable energy systems



From old to new technology: Green technological change and change in value-added profile.



From fossil to renewable energy



The reduced role of existing power companies

1. The fossil fuel systems are replaced by for instance wind- and photovoltaic "powerplants" **which are automatons produced at factories** (not in power companies). Once in place, they just feed electricity into the grid.
2. The value-added share of electricity prices linked to power company activities **thus is reduced by 60%-80%**.
3. The new "power plants" are small flexible heat and power plants **close to the consumers** and therefore **often will be owned by the consumers.**
4. The needed regulation infrastructure is close to the consumers, and for instance **the municipalities will get an increased role** to play.

1-4 reduces the role of existing power companies drastically.

From fossil-to Renewable Energy the case for "Innovative democracy"

1. **Politically weak** renewable energy- and energy conservation technologies must **gain massive market shares**.
2. **Politically strong** coal, oil, gas and uranium based power technologies must **lose massive market shares**.
3. This gives a conflict with strong fossil fuel technologies/interests.
4. The **political challenge** is to make strong technologies lose turnover, and weak new technologies gain market shares".

This political challenge requires

"Innovative democracy", or political strength to lobbyists that are independent of the fossil fuel interests.

3. Case

The Danish full scale shift from
energy policy to uncontrolled market
Governance

1974-2002

“INNOVATIVE DEMOCRACY”

versus

“BACK TO MARKET”/“NO POLICY”

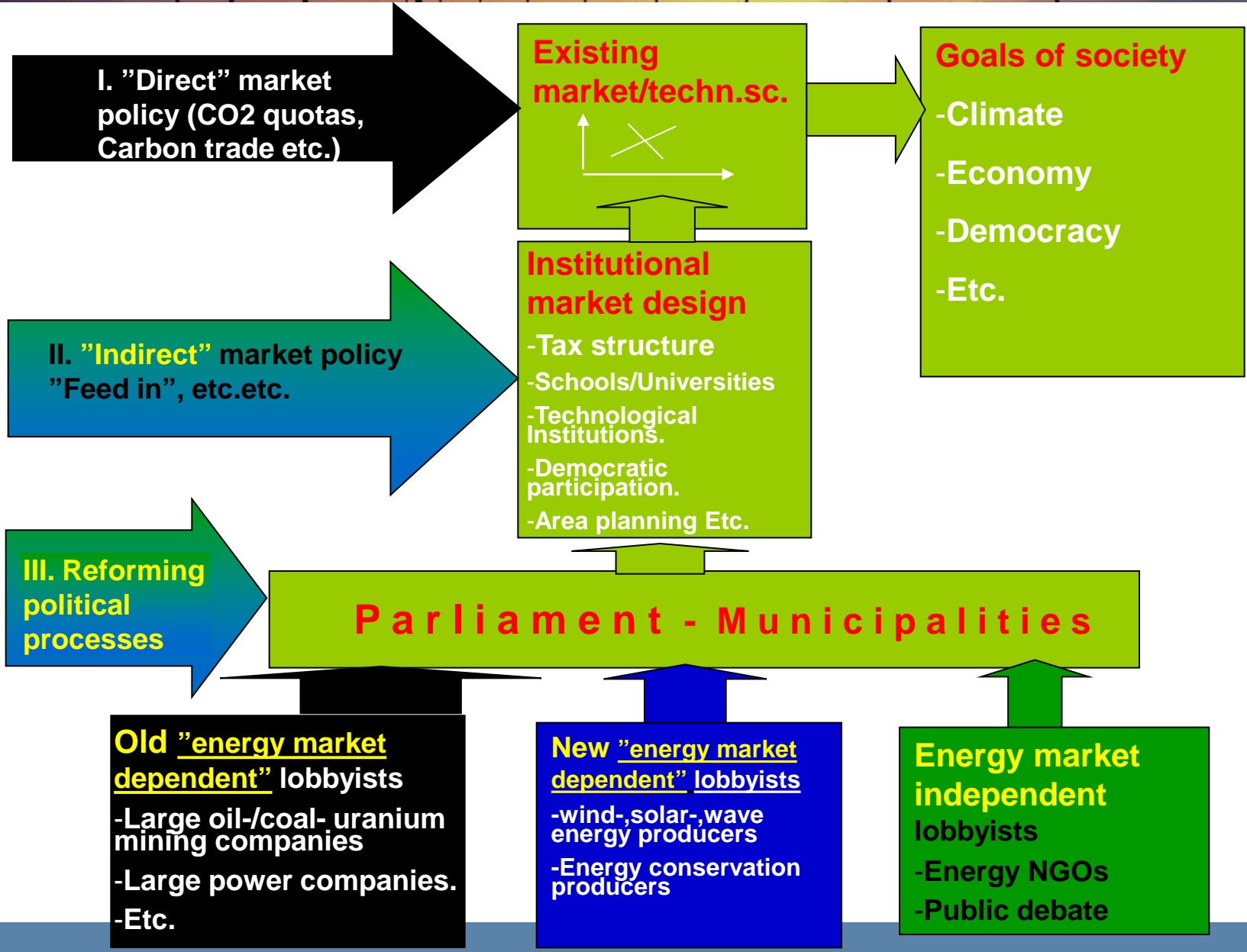
-a Danish full scale experiment 2002-2007/2011,

**and what now-
2012-----?**

Innovative Democracy (1974-2002)

Innovative democracy (Denmark 1974-2002)

Aalborg University



"Innovative democracy" results 1974-2002

1. Renewable energy generates almost 26% of electricity consumption (20% wind energy).
2. 60% of heat from cogeneration
3. Export for around 6 Billion EURO annually.
4. Around 35.000 persons employed.
5. The Danish GDP has increased by 80% since 1973 without any increase in energy consumption.
6. Low electricity prices due to consumer ownership

Back to market/No policy 2002-2008

In 2002 a new right wing Government
turned away from the

”INNOVATIVE DEMOCRACY”

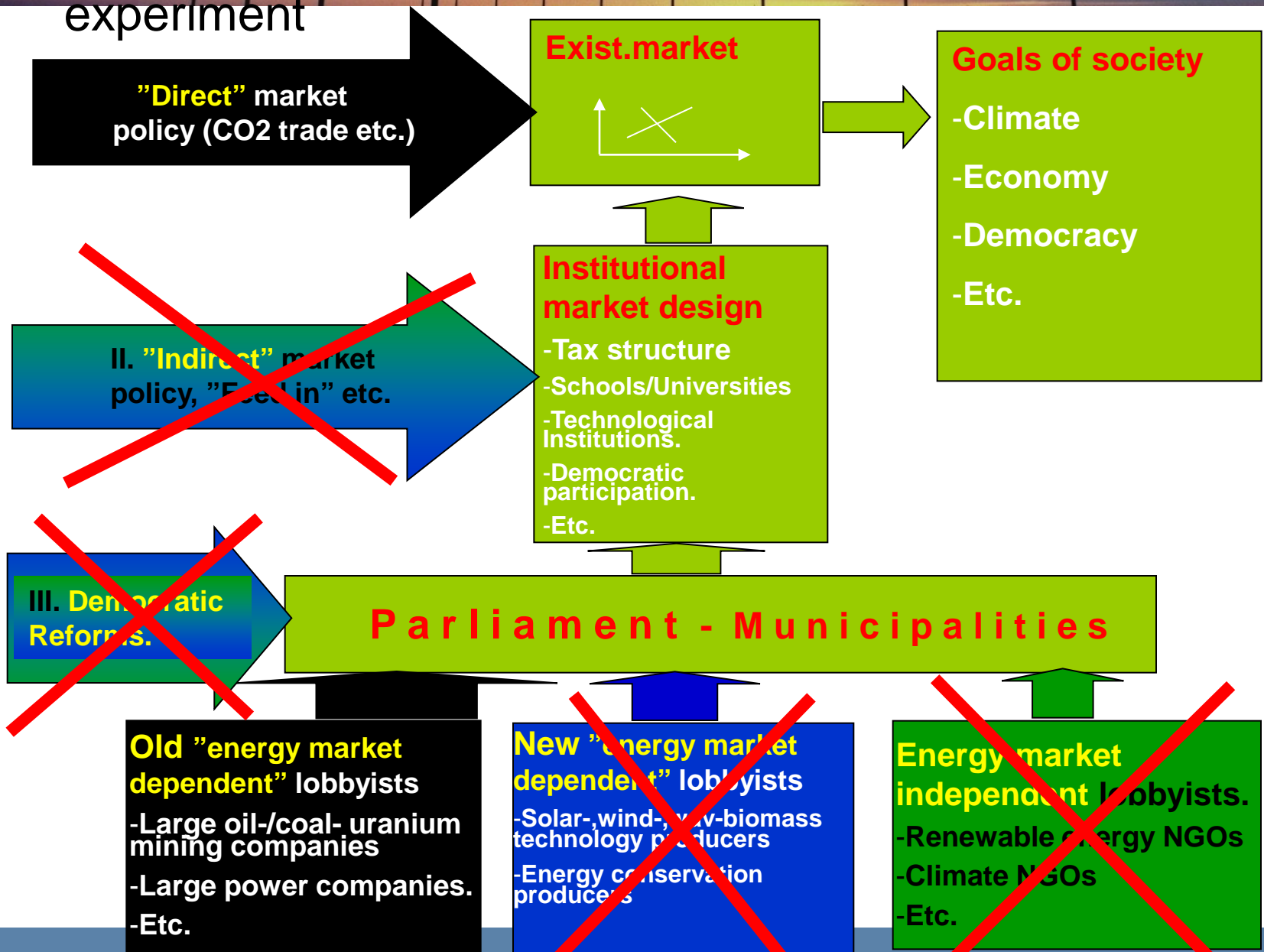
approach

and reintroduced a neoclassical:

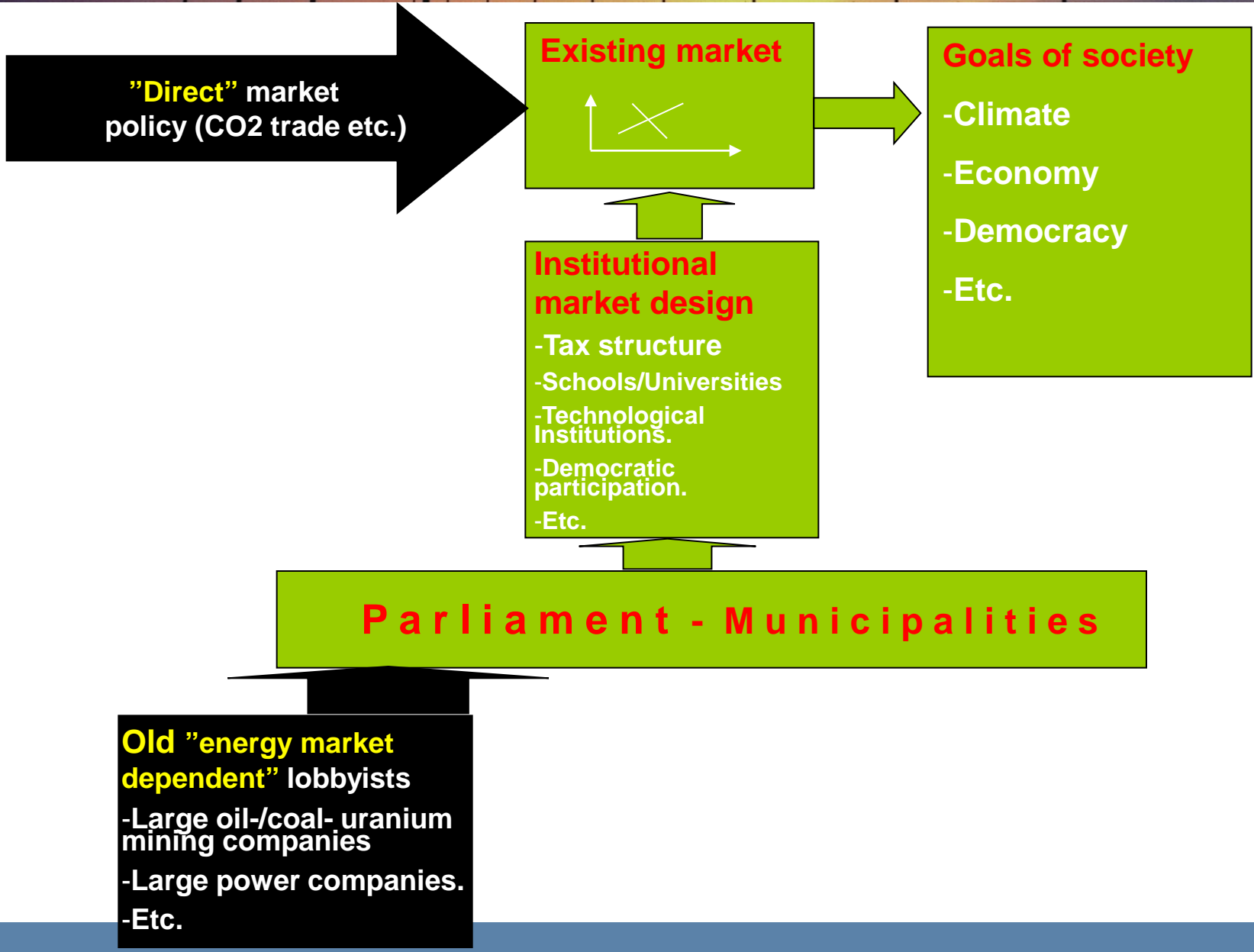
”BACK TO MARKET”/”NO POLICY”

approach.

The 2002-2007 "BACK to MARKET"/"NO POLICY" full scale experiment



Back to "MARKET" or "NO POLICY" 2002-2007



The results of the "BACK to MARKET"/"NO POLICY" approach.

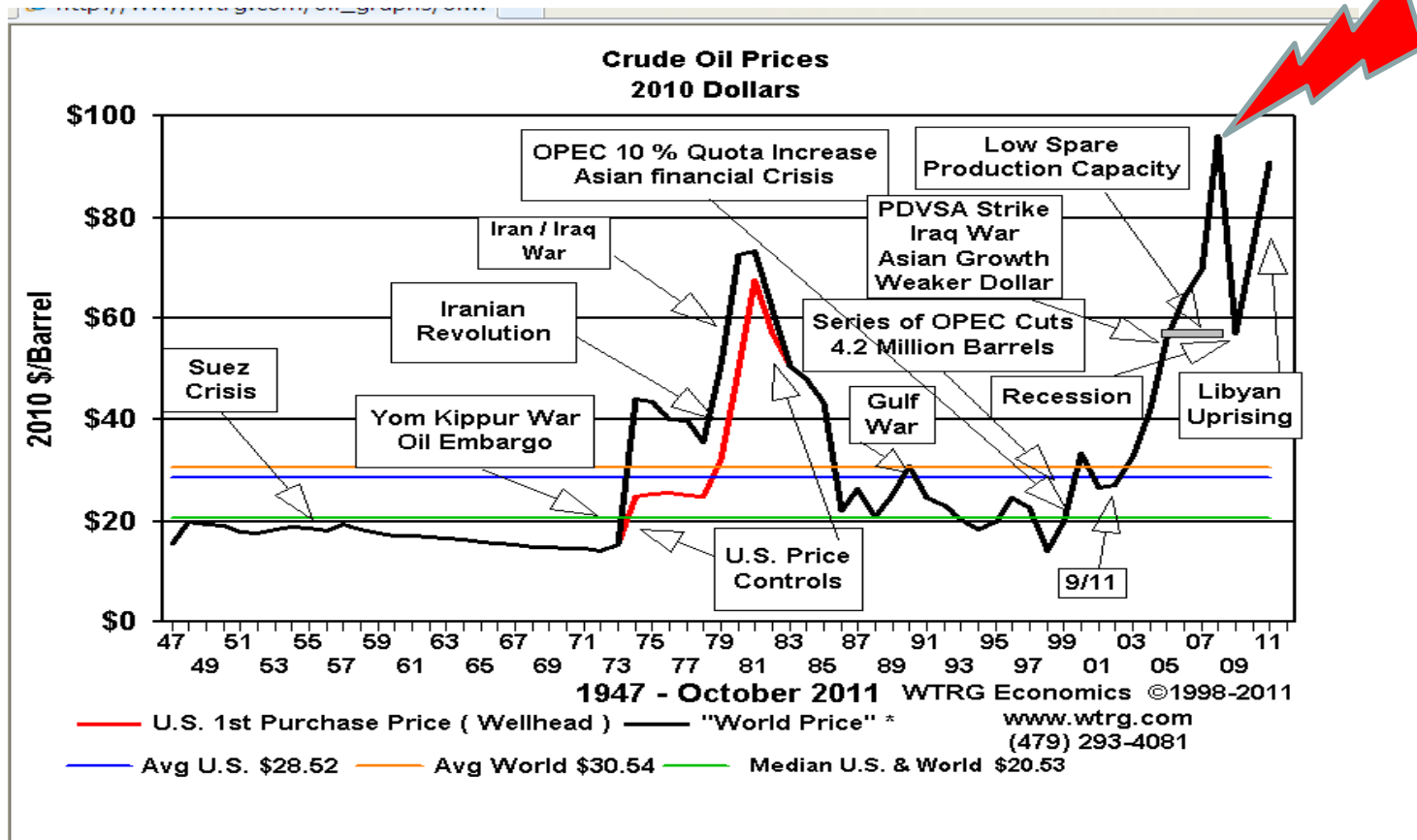
1. From 2003-2008 almost stop for new wind power capacity.
2. No reduction of CO2 emissions.
3. No policy for new Renewable Energy technologies like photovoltaic, wave power etc.
4. No efficient energy conservation programs.

The Danish "full scale experiment" has shown that this "BACK to MARKET" "NO POLICY" approach does not work for renewable energy implementation.

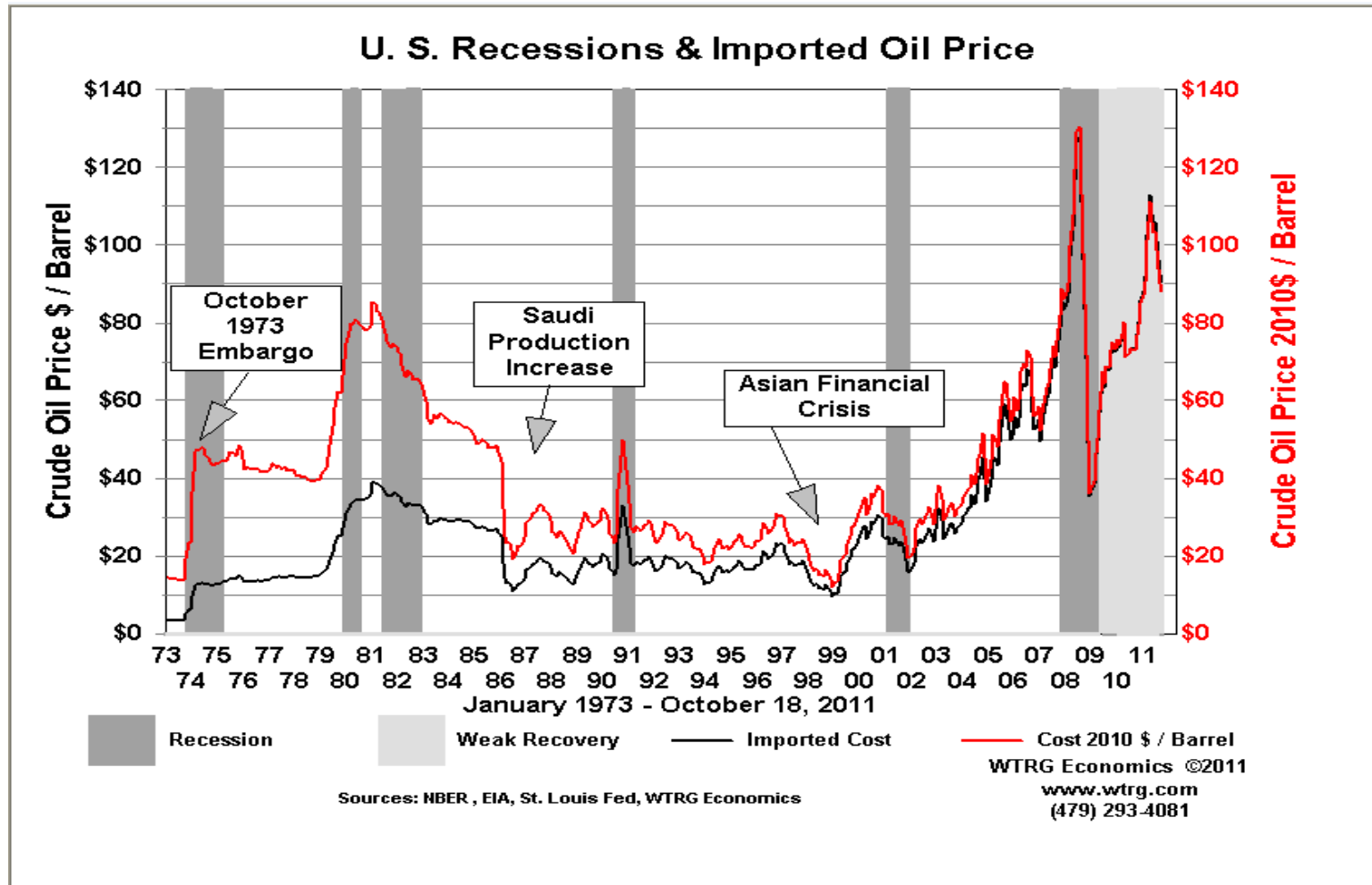
II. Economic crisis and energy policy at a crossroad

Oil price development 1947-2011

<http://www.wtrg.com/prices.htm>



The link between oil prices and recessions.



US oil import and the **economic** crisis

	Net import 1000 barrels per day	Average price per barrel US\$	Annual net import of petroleum products Billion US \$	Balance of payment in billion US \$	US \$ increase in foreign debt per member of workforce (140 mill.)
1970	-	2	-	2.2	-
1995	7.886	16	46	-96	685
2001	10.900	21.5	86	-365	2.607
2008	11.100	95	386	-677	4.835
2001-2008				-4.732	33.800
1993-2000				-1.286	9.185

More an economic/ecological crisis than a financial crisis

The economic crisis is mainly caused by the **increased fossil fuel/oil dependency**

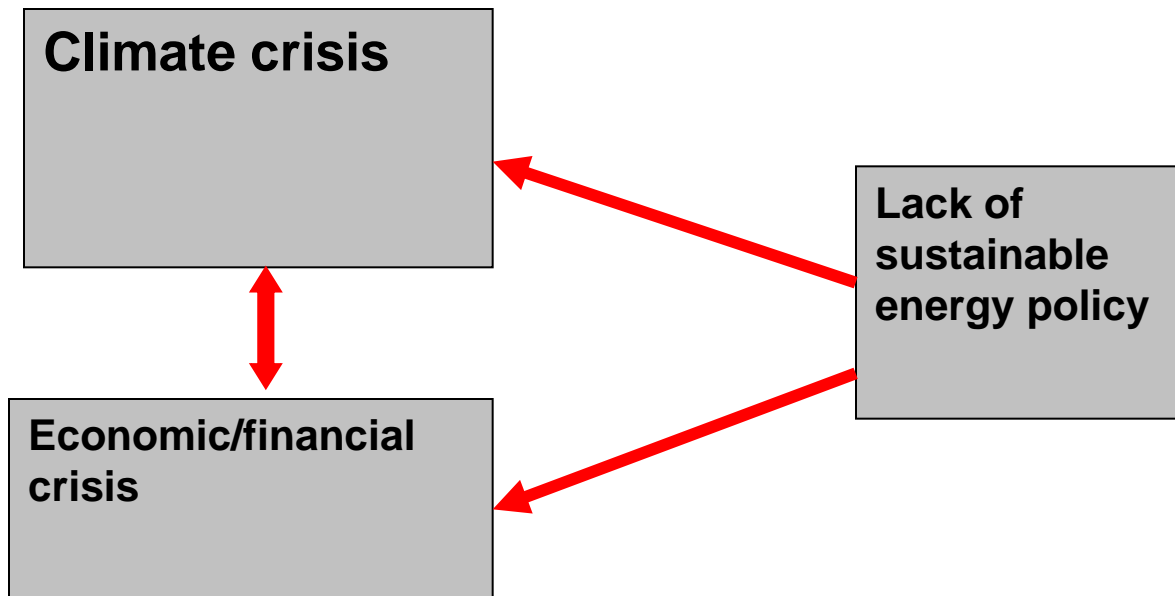
The fossil fuel/oil dependency is also **causing the climate change problems.**

(Robert Reich: The Economic crisis also caused by an increased income disparity (1% has 20% of the incomes in 1929 crisis and in 2008 crisis))

Clearly the weak financial institutions **boosts the economic- and climate problems!!**

Lack of sustainable energy policy:

The common cause of economic crisis and climate crisis



Market reactions hampering green technological innovation

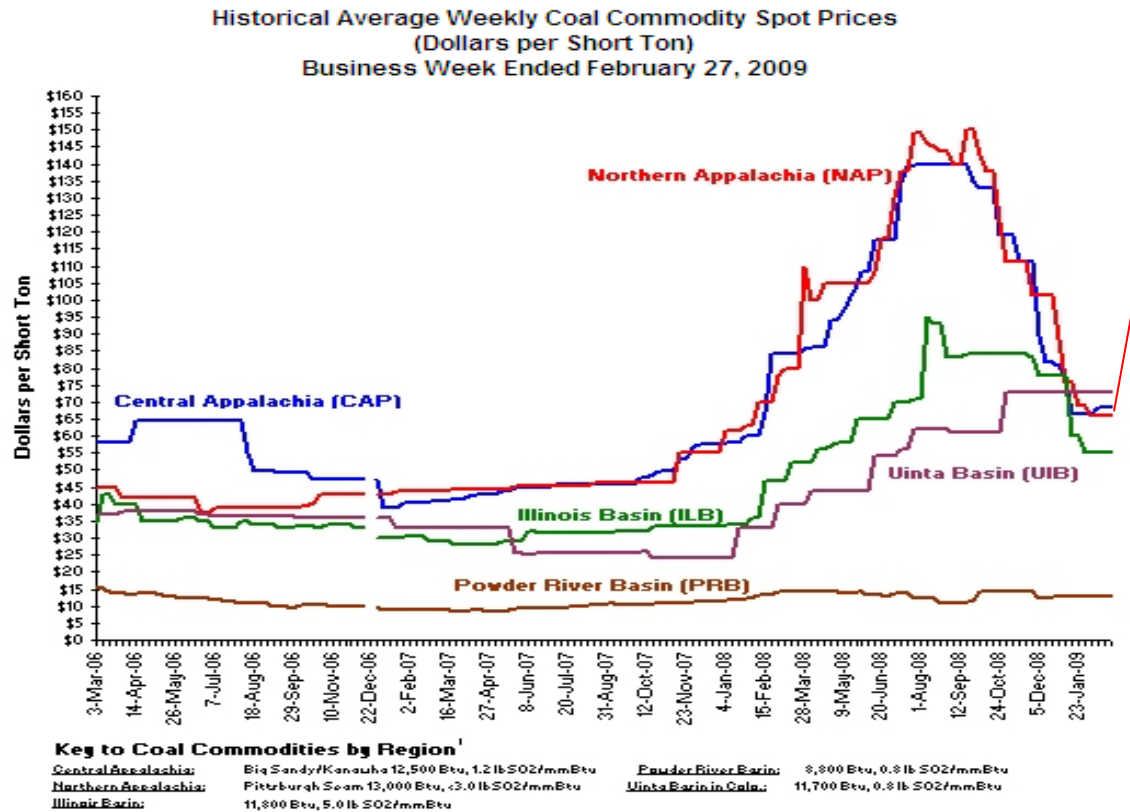
The rise and fall and rise oil prices

Weekly All Countries Spot Price FOB Weighted by Estimated Export Volume



Source: U.S. Energy Information Administration

The rise and fall and rise of coal prices

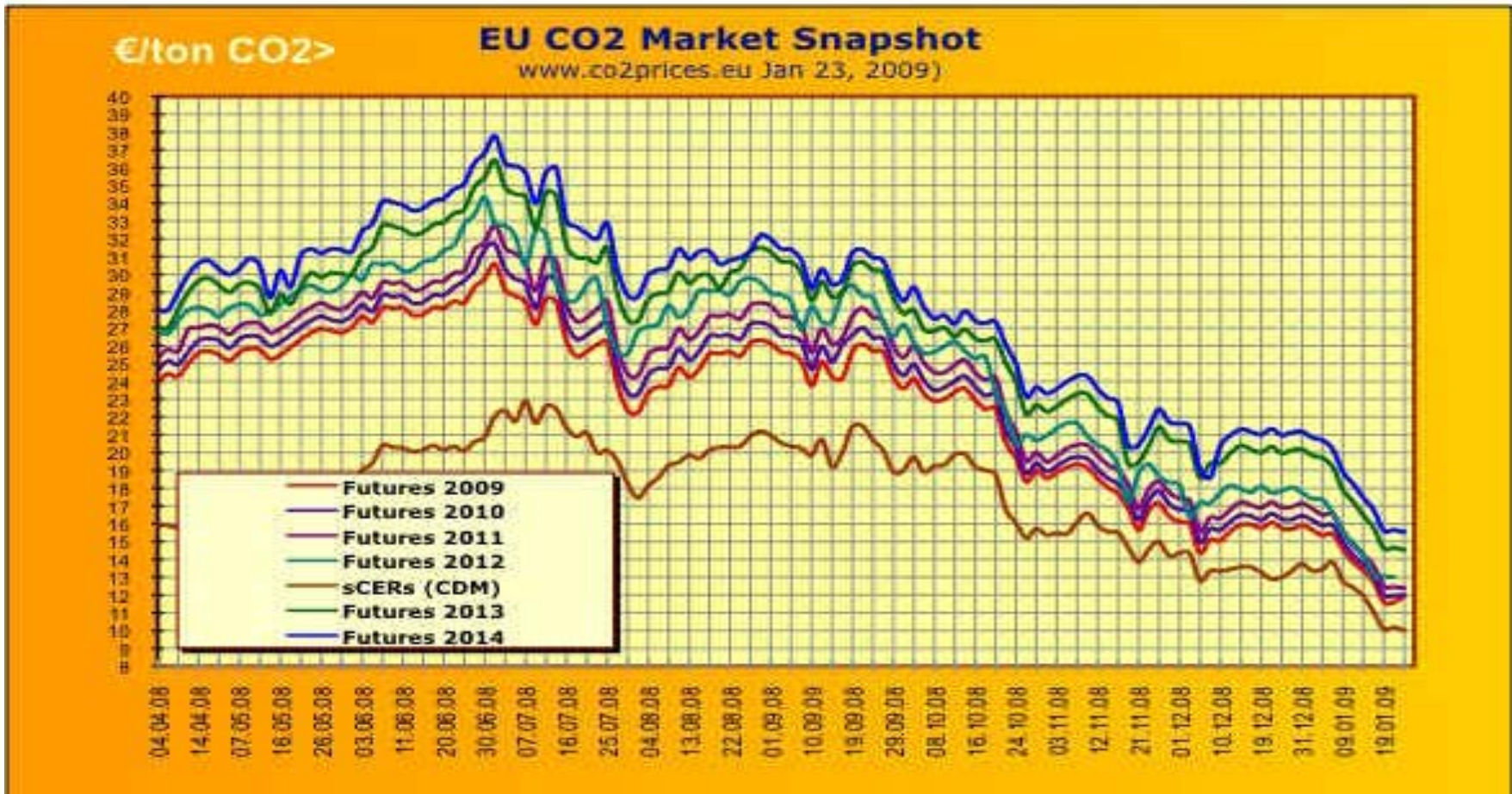


¹Coal prices shown are for a relatively high-Btu coal selected in each region, for delivery in the "prompt quarter." The prompt quarter is the quarter following the current quarter. For example, from January through March, the 2nd quarter is the prompt quarter. Starting on April 1, July through September define the prompt quarter.

Source: With permission, selected from listed prices in Platts Coal Outlook, "Weekly Price Survey."

Note: The historical data file of spot prices is proprietary and cannot be released by EIA; see <http://www.platts.com/Coal/>. > Analytic Solutions > COALdat, or > Newsletters > Coal Outlook.

The rise and fall of CO2 prices



Financial crisis

The rise and fall of willingness to finance houses, projects etc.

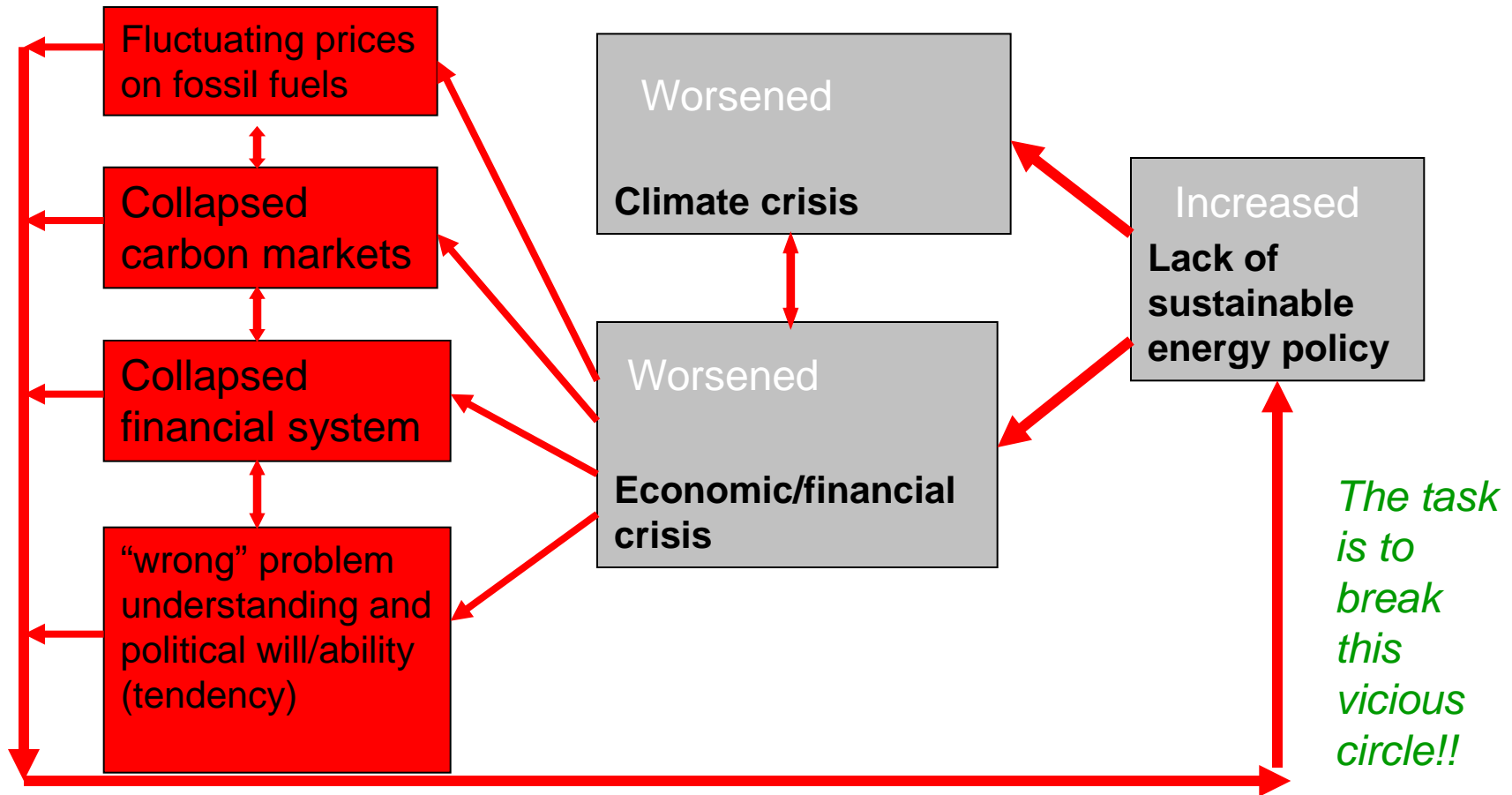
Economic crisis and climate policy

Tendency to wrong economic paradigm:

“Due to the economic crisis we cannot afford implementing sustainable energy technologies.”

“We have to lower the taxes” - *which usually increases the income disparities, and economic crisis! (Robert Reich- 2011)*

The **vicious circle** of present climate, energy and financial policy hampering green tech. innovation



Problem:

Fluctuating prices on fossil fuels hindering stable innovation conditions for sustainable energy technologies.

Solution:

Oil tax keeping oil prices at (for instance) minimum 120 US\$ per barrel.

Similar solution for other fossil fuels.

Problem: Lack of “green techn”. financing

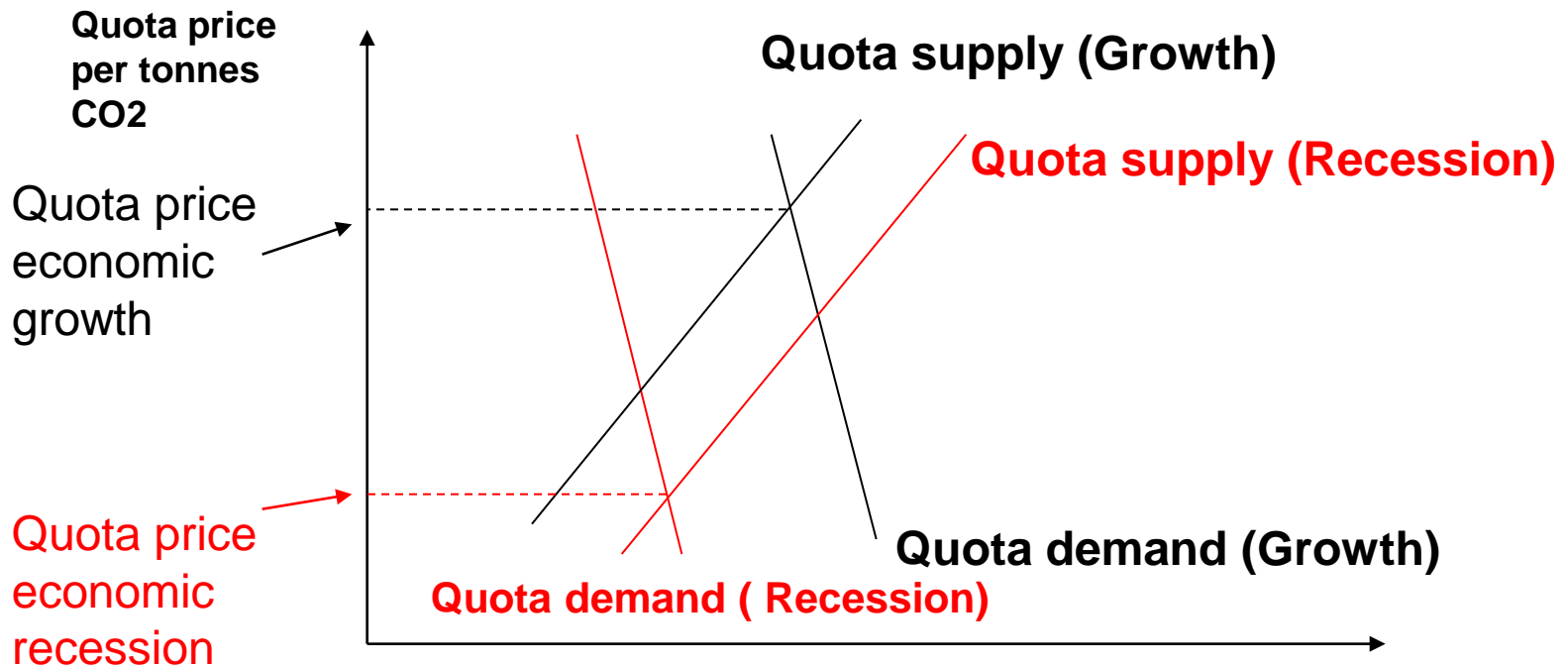
Solution: Public guaranty for investment in sustainable energy technologies.

(Just a small fragment compared to the present guaranties to the banks, but directly linked to projects. Has been used succesfully for Danish district heating projects)

Problem:

Collapsed CO₂ markets destroys stable markets for sustainable energy technology innovation.

Economic crisis and the systemic failure of the present “amount” quota system.



This price reduction/oscillation hampers green energy innovation seriously !!

The need for energy “efficiency” quotas (Example!!).

Year	Gram CO2 per kWh electricity
2010	535
2011	520
2012	505
2013	490
2014	475
2015	450

2020	375

Efficiency quotas versus the present amount quotas.

	Efficiency quotas	Amount quotas
Tradeable?	yes	yes
Area of use	Power plants , large firms,small firms,households	Power plants and large firms
Price stability under different growth conditions	High price stability as the quota is linked to kWh emission.	Low price stability, as the quot is linked to the absolute CO2 emission.

The problem of increased income disparity

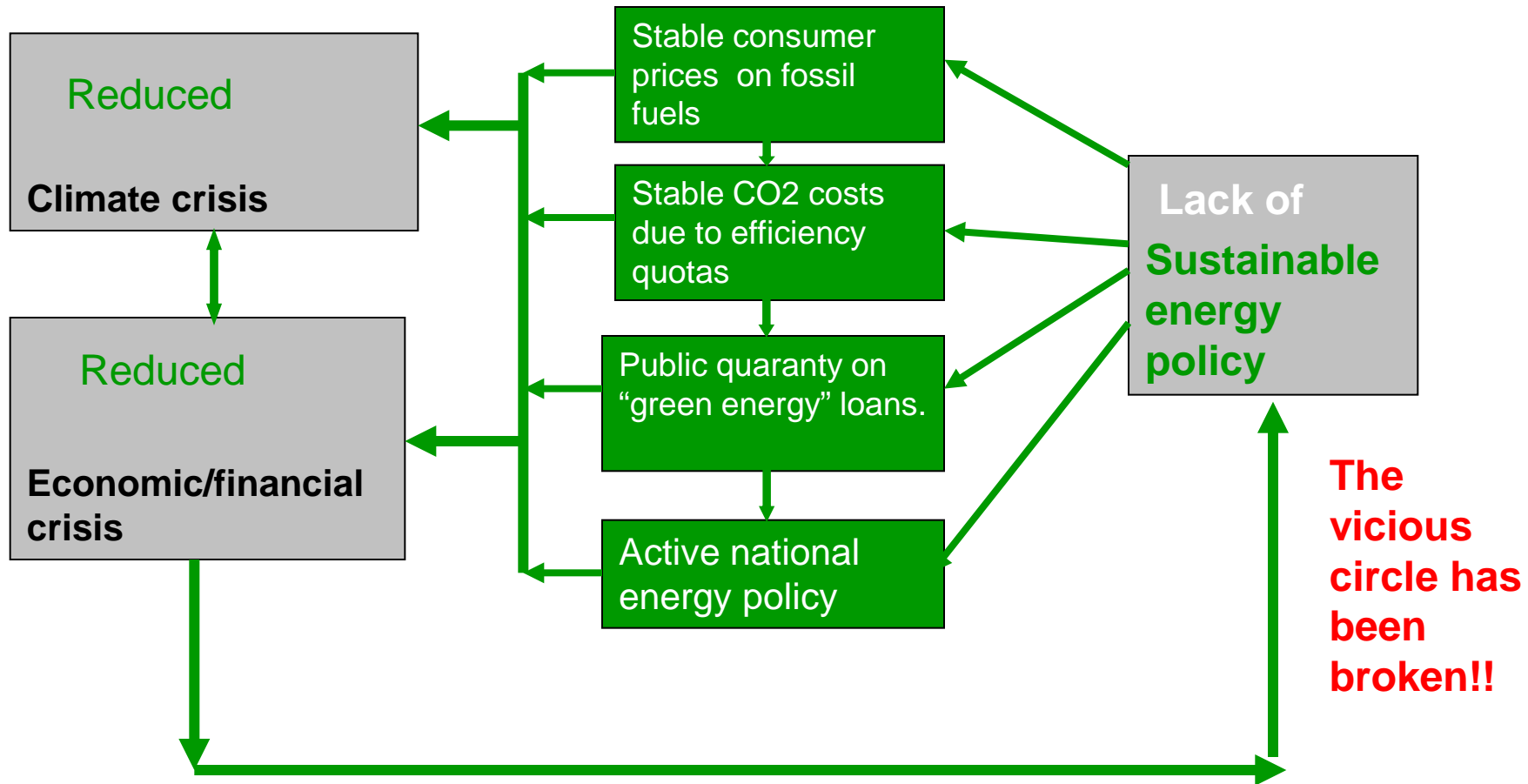
Problem:

- Increase income disparity
- Fuel poverty

Solution:

- Redistribution of incomes
- Energy policy against fuel poverty

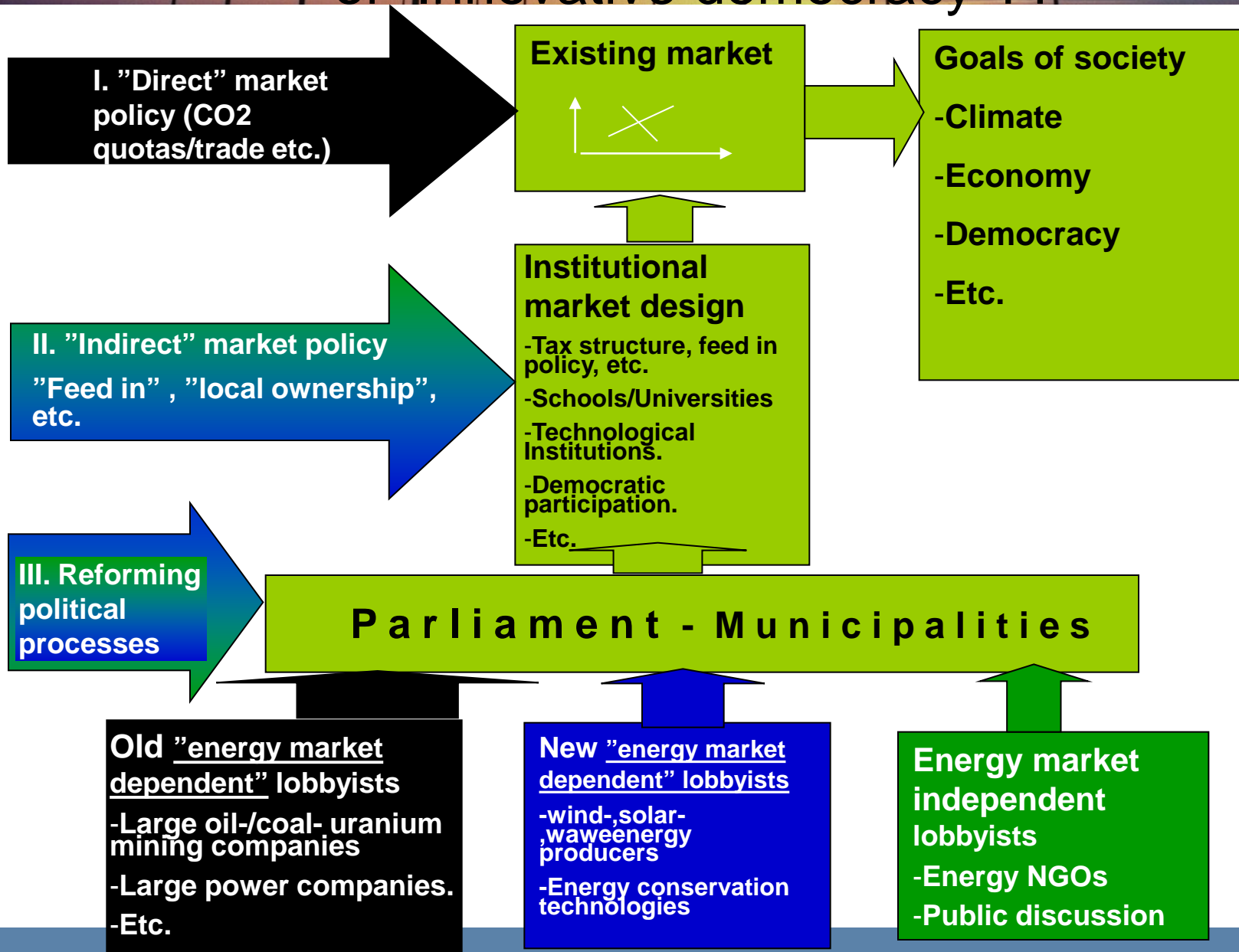
The “good circle” climate, energy and financial policy



III. Reestablish Innovative Democracy

Sustainable Energy Planning

Re-establishment of "Innovative democracy"??



Sustainable Energy Planning Needed: Innovative Democracy

1. Energy market independent interest groups should have increased influence on policy formation.
2. Establish systematic “Green energy plans” for all countries (EU requirement).
3. Remove the present “barriers to entry” for investors that are independent of present fossil fuel companies.
4. Introduction of new “intermittency” infrastructure (heat pumps, electric cars, etc.)
5. Regional and local ownership of intermittency infrastructure and renewable energy systems.
6. Establish “innovative markets” with good “feed in “ tariffs for newcomer Renewable Energy technologies.
7. Establish “Feed in “ tariffs for all fluctuating Renewable Energy technologies.
8. Remove all fixed energy tariffs.
9. Remove the present “pollution” subsidies to fossil fuels and uranium.
10. Establish financial schemes with long term low interest loans for Renewable energy and energy conservation investments.
11. Policies against fuel poverty

In general:

Establish an innovative democratic process that is independent of the fossil fuel and uranium interests.

This has worked before with great success (1974-2002) and also is possible in the future.

Goals of the new Government

1. 40% reduction in CO₂ emission compared to 1990.
2. From 22% (2011) to **50% wind** power in 2020
3. 50% reduction in heat use per m² before 2050
4. 100% Renewable Energy in 2050 (when people born today are 38 years old).

For energy planning **2050 is now!**