



**BC>AD>PC**

**PC - The *Post Carbon Age***  
**- there is another way**

[www.thepostcarbonage.com](http://www.thepostcarbonage.com)

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This presentation is split it into 3 logical sections:

I. What is the issue and what are our aims?

II. Problems with the status quo

III. What do we need to do?

It **will** shortly be available on the web as a full paper:

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## Section I – What are our aims?

- As we all know, global warming is here, it is progressive, its everywhere – so by definition:
- It **IS** a **WORLD** problem
- It's principal cause is excess anthropogenic CO<sub>2</sub> resulting from energy created by the combustion of "*Free Burn*" Hydrocarbons (HCs).
  - *NOTE: Free Burn* Hydrocarbons are those which are used to produce energy with to consequent uncontrolled release of CO<sub>2</sub>.

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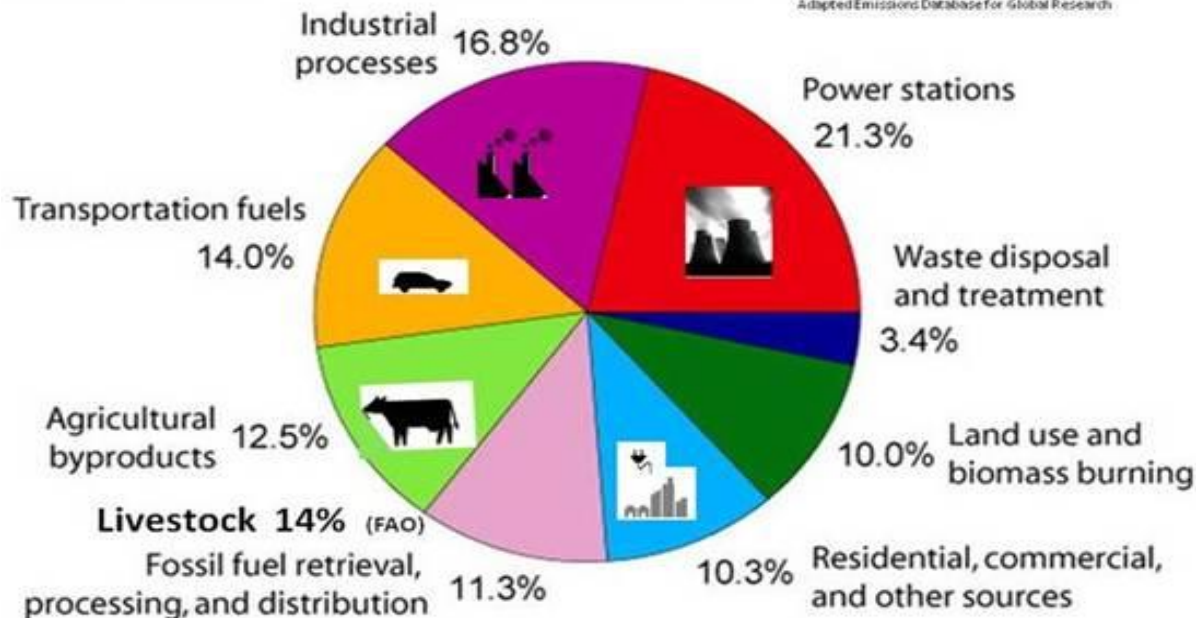
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## Section I – What are our aims?

We are all familiar with the WORLD EMISSIONS graph:

### Annual Greenhouse Gas Emissions by Sector

Adapted Emissions Database for Global Research

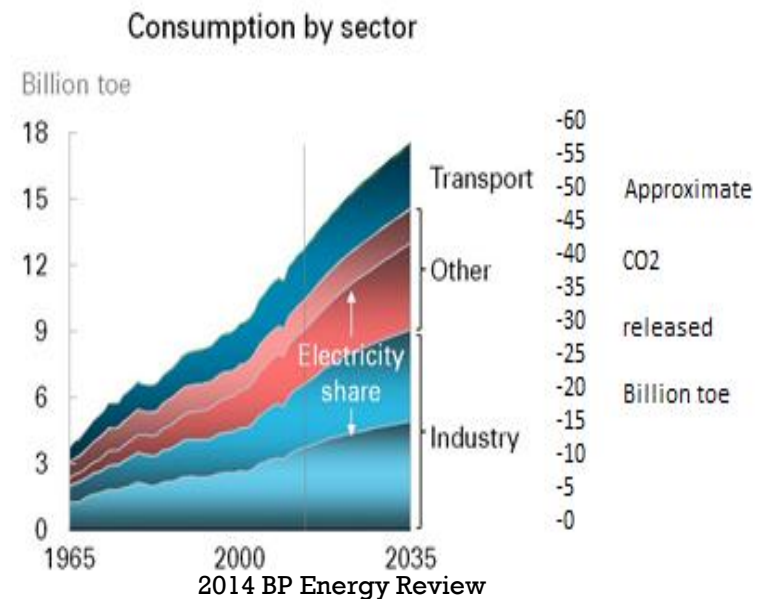


Hydrocarbon (HC) combustion produces the lion's share c.70% of world greenhouse emissions.

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## Section I – What are our aims?

- ◆ and .....the world's energy appetite is growing.



To date, we have tried to control this by directly focusing on the amount of CO<sub>2</sub> emitted.

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## Section I – What are our aims?

### Our **CRITICAL AIMS** are therefore:

1. To reduce CO2 emissions to a **tolerable level** <sup>1</sup>
2. To do so across the WORLD in an **acceptable time frame** <sup>2</sup>
3. To do so at a price that the WORLD realistically can meet and accept and...
4. Without **competitive and inflationary** impositions of **taxes** and/or **subsidies** by world governments

**World science is the arbiter of the questions raised in Aims 1 & 2:**

1. **tolerable level and**
2. **acceptable time frame.**



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## Section I – What are our aims?

So the system/mechanism to achieve these Aims must be:

- Able to accomplish the **critical aims**,
- Free market driven,
- Able to attract massive commercial investment - in which case, it needs to have **minimum bureaucratic/government involvement**,
- The smallest logical structure, with fewest entities needing to be controlled, and therefore, is the **simplest to administer**,
- Lowest in overhead to operate/manage,
- Transparent & Auditable,



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## Section I – What are our aims?

BUT trying to directly control/reduce the amount of CO<sub>2</sub> emitted over countless industries/counties is:

- Immensely cumbersome and expensive.
- It is divisive in the way it applies to each consumer, each industry and each country
- It does not address some of our **critical aims** nor the means for their accomplishment (later)

NOTE: Electricity generation has been the main target to date but it creates only 21% of anthropogenic CO<sub>2</sub> so it is not the only emitter – even if it was totally successful, there is still a long way to go.





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## Section I – The story so far

Over the past >10 years, two fundamentally different approaches have been tried:

- A. Subsidising Cfree energy:** by use of (divisive and publically provided) direct subsidies to **decrease** energy costs/prices for specific projects.
  - B. Taxing or Charging HC energy producers** These, such as Carbon tax or ETS, aim to **increase** the cost/price of HC energy to allow Cfree energy to compete.
- Some cat. A methods have achieved limited investment
  - No cat. B methods have worked yet to promote a single Cfree investment. These are doomed to continuing failure.

**There must be a better way.....**



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## Section I – The story so far

### What we have tried so far – **Approach A:**

*Direct subsidies have been the only methods so far that have achieved any investment – but at a large public cost.*

For political/consumer acceptance reasons, the baseline adopted for **subsidised energy price** competition has been as close a possible to the current cost of “**free burn**” **HC** but “**free burn**” **HC** at any appreciable scale is doomed to eventual extinction (see later).

So, if we continue on this basis, we would be left with the frightful result of low energy cost/price across the board ----- all **subsidised by comparison with a non-existent historic competitor!**



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## Section I – The story so far

### What we have tried so far – **Approach B:**

- **Carbon taxes & ETS schemes BOTH** impose, *at the whim of governments*, huge costs upon participating economies.
- This economic “hit” occurs **many years (c.10) before** the very first reduction in CO<sub>2</sub> would be achieved from *any* resulting investment into Cfree competition.
- **EU ETS in addition** is logically flawed and can't work for a number of fundamental reasons (explained later).

**Carbon taxes & ETS schemes** interfere with the normal working of the energy markets and so:

**deter the vital ingredient - *investor engagement***

**So far, neither Carbon taxes nor ETS has worked to promote a single Cfree investment.**



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### **Section II** - Problems with the status quo

#### What we have tried so far – **Approach B:**

##### 1: Carbon tax & ETS

Carbon tax or ETS on **HC energy** is capable of removing the competitive imbalance with  $C_{free}$  energy and provoke investment.

#### ***BUT only if:***

- A. The post-tax (or ETS permit levied) selling price of HC energy rises to the price of  $C_{free}$  energy - the ***price tipping point*** and
- B. This ***tipping point*** price has somehow to be ***guaranteed*** to be maintained at that level until the investment has matured,

**Otherwise, this is not an investable proposition**



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**Section II** - Problems with the status quo:

What we have tried so far – **Approach B:**

1: Carbon tax & ETS

**Before** it reaches the *energy price tipping point* :

- Neither scheme will have any impact on *investment* into alternative *C<sub>free</sub>* energy.
- And therefore will provide no benefit in terms of emissions reduction.



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### **Section II** - Problems with the status quo:

#### What we have tried so far – **Approach B:**

##### 1: Carbon tax & ETS

However, immediately either scheme is applied *at any level, before or after the tipping point*, then selectively in any individual economy it will:

- Greatly increase the cost ( $> X2$ ) of energy from all the **presently installed capacity** in **that economy**.
- Create a tremendous competitive obstacle for that economy viz-a-viz the rest of the world.



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### **Section II** - Problems with the status quo:

#### What we have tried so far – **Approach B:**

##### 1: Carbon tax & ETS

These effects would occur from inception before the energy tipping point has been reached and persist after the energy price tipping point had been reached WHEREUPON :

- A further c.10 years goes by before any new **Cfree investment** would be committed, built and commissioned.
- Only at that point, emission levels would just begin to moderate.
- It will take a further c. 25 years before **Cfree investment** could become a significant energy source with emissions levels down to target levels.
- Thus, the WORLD would be paying the price in energy bills 10 years before any emission reduction is achieved and up to 35 years before it received all of the environmental benefit for which it has paid.

**This would be a very inefficient economic undertaking.**

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## **Section II** - Problems with the status quo:

### What we have tried so far – **Approach B:**

#### 1: Carbon tax & ETS

In NPV terms the economic cost can be shown to be c. 20 times the cost of just subsidizing individual investments as they occur.

*Two final question also arise with respect to Carbon Tax and ETS:*

- who does the taxing/revenue collecting?  
and
- where does this revenue go?

The NER300 is an interesting convoluted in this respect, having shot itself in the foot by flooding its own market, collapsing its price/revenue and then having insufficient revenues to subsidize Cf free competitors.





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**Section II** - Problems with the status quo

What we have tried so far – **Approach B:**

## **2: Emissions Trading Schemes (ETS)**

As well as sharing some of the problems of carbon taxes, Emissions Trading Schemes (ETS) are *actually worse than carbon taxes*.

Over the last ten years:

- ETS schemes, (such as the much-vaunted EU ETS) have never incentivized a single *Cfree* energy investment.
- They are racking up government receipts and increasing energy costs wherever they exist.

**We have an elephant – and it's still in our room!**



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**Section II** - Problems with the status quo:

What we have tried so far – **Approach B:**

## **2: Emissions Trading Schemes (ETS)**

There are two reasons for this:

1. ETS schemes suffer all the same problems as carbon tax.
2. More fundamentally, they operate in a *false* market.



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**Section II** - Problems with the status quo:

What have we tried so far – **Approach B:**

## **2: Emissions Trading Schemes (ETS)**

ETS schemes sell *permissions* to emit CO<sub>2</sub> (EUAs under the EU ETS).

*Permissions* are traded on the carbon market.

It is a *false* market, which doesn't work and logically cannot work as a *proper* market.



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**Section II** - Problems with the status quo:

What we have tried so far – **Approach B:**

## **2: Emissions Trading Schemes (ETS)**

- In a *proper* market (e.g. potatoes or grain) the market price is determined by tension between supply and demand.
- So if potatoes are in short supply the market price goes up and this moderates demand so that the price falls again until there is equilibrium.

**Simple!**



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**Section II** - Problems with the status quo:

What we have tried so far – **Approach B:**

## 2: Emissions Trading Schemes (ETS)

*This is not so in the so-called “carbon market”*

or even when called the “carbon emissions market”.

This is because:

- it isn't a carbon market,
- it isn't a carbon emissions market,
- it is a carbon emissions **permissions** market (CEP).



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### **Section II** - Problems with the status quo

What we have tried so far – **Approach B:**

## **2: Emissions Trading Schemes (ETS)**

**Looking at the supply side:**

- In a *carbon emissions permissions (CEP) market*, the CEPs are printed by government agencies. (e.g. EUAs)
- CEPs are in effect just tokens or currencies (and share some of the characteristics of currencies such as speculation and inflation/deflation).
- The number of CEPs available for sale is a result of government's policies.



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**Section II** - Problems with the status quo

What we have tried so far – **Approach B:**

## **2: Emissions Trading Schemes (ETS)**

Looking at the demand side:

Demand is only marginally affected by energy market conditions. e.g. when a new HC energy provider comes into the market or an existing HC energy provider leaves the market.

So the demand for CEP will be relatively static:

It will take a long time to replace the world's installed **HC energy**. (In electric power alone, it constitutes >5000GW or approx. 9000 major (>600MW) power plants).

***So for many years the CEP price would be determined almost completely by the supply side – the printing press.***



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### **Section II** - Problems with the status quo

What we have tried so far – **Approach B:**

#### **2: Emissions Trading Schemes (ETS)**

**The supply side:**

- If governments allow the supply of CEPs to be generous, their price will be low and there is no incentive for  $C_{free}$  investment.
- If governments restrict the availability of CEPs then the price will rise to the level, which incentivizes investment in  **$C_{free}$  energy** and eventually **the tipping point**.

***Success!***





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**Section II** - Problems with the status quo

What we have tried so far – **Approach B:**

**2: Emissions Trading Schemes (ETS)**

**Not really!!**

Look at the **demand** side again.

Each successful investment in replacement  $C_{free}$  energy then *reduces* demand for CEPs.

This propels the price lower.

***This is in the wrong direction!***

***The incentive declines with each success.***

***So,  $C_{free}$  investment potential dies with every success***

***In other words, this is a false market.***



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**Section II** - Problems with the status quo

What we have tried so far – **Approach B:**

So both **Carbon Tax** and **ETS**, have severe problems



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### **Section II** - Problems with the status quo

#### Management and organization

Finally, yet another fundamental problem arises with all schemes based on direct control of emissions. This is:

- **The magnitude, variability and complexity of CO<sub>2</sub> emissions sources.**

To directly control CO<sub>2</sub> emissions throughout the world we are dealing with a huge *organizational* problem of handling so many millions of individual emitters.

If we don't do it throughout the world we won't meet the **key aim** of defeating global warming and will set up political tensions between economies competing on the basis of tax, subsidy and compliance.



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### **Section II** - Problems with the status quo

#### Management and organization

The electric power industry has alone has c. 9,000 significant (>600MW) power plants (plus thousands of small fry). Yet, they *emit just 21% of world CO<sub>2</sub>*.

To manage the replacement of just this vast sector, presents a massive organizational challenge and demands a huge investment, and professional and labour workforce.

However, beyond the electricity generation industry there is a even larger, ubiquitous and much more diverse community of emitters including; **cars, planes ships, chemical plants, agriculture etc.**

They contribute *the remaining 79%.* !



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**Section II** - Problems with the status quo

Management and organization

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To **meet our Critical Aims** by regulating WORLD CO<sub>2</sub> emissions directly would be a complex and unique management challenge for mankind.

***We need another way! – let the market take the strain***

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## Section III - What do we need to

### There is a better way.....

- ❑ It is beyond doubt that our **Critical Aims** can only be accomplished by triggering truly competitive *investment* in “Cfree” energy and the *phasing out* of “Free Burn” HC energy
- ❑ Within such a competitive process, *HC production* can only continue and prosper in **two ways** (without causing destructive global warming):
  1. HC production curtailment and/or
  2. HC *combustion* processes becoming Cfree through decarbonisation (e.g. CO<sub>2</sub> removal/ re-sequestration).

**It is therefore in the interests of the world and specifically in the interests of the HC industry, that HC decarbonisation processes are deployed at scale throughout the world.**

(in the same way that the water industry also takes responsibility for sewage.)

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## Section III - What do we need to do?

Rather than focusing on CO<sub>2</sub> emissions control, PERHAPS it is better to switch emphasis onto controlling HC extraction and usage?

This can be achieved simply by applying a global maximum allowance for **anthropogenic CO<sub>2</sub>** and applying market principles of supply and demand in a properly structured way upon the cause of the emissions – **“Free Burn” HC production.**

CO<sub>2</sub> emissions will reduce in strict proportion to **“Free Burn” HC** – they are the same carbon atoms.

HC + Oxygen = *Energy* + Water + Carbon Dioxide

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## Section III - What do we need to do?

A number of options can be explored. **One** way to do this is to :

- divide the *HC market* into two:
  - **Black HC** - HC destined for "free burn" which emits CO<sub>2</sub>
  - **Red HC** – HC destined for "Cfree" purposes which do not emit CO<sub>2</sub>. These include those which remove their combustion CO<sub>2</sub> from the environment, including CO<sub>2</sub> re-sequestration.



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## Section III - What do we need to do?

- The *extraction for sale of **Black HC*** will be controlled on a progressively reducing trajectory based on tolerable carbon content
  - Within say c.35 years this will probably need to have fallen to 10-20% of current HC production and then down to zero by the end of the century (or fall to a level which the atmosphere of the planet can tolerate on a sustainable basis). If ZERO is insufficient then, perhaps only Direct Air Capture can solve the problem.
- The *extraction for sale of **Red HC*** will continue at unrestricted rates to accredited<sup>1</sup> customers for approved purposes (e.g. involving zero<sup>2</sup> CO<sub>2</sub> emission including CO<sub>2</sub> re-sequestration).
  1. The accreditation of use can be handled on a commercial basis by existing certification agencies.
  2. Or near zero in which case the excess CO<sub>2</sub> will have to be assessed for consideration of Black HC fuel %

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## Section III - What do we need to

**There is a better way.....**

- ◆ **Black HC** energy will become a boutique industry catering for special priority needs where no realistic  $C_{free}$  competition yet exists.
- ◆ **Red HC** energy will compete freely without subsidy or special taxation with unsubsidised renewables industries and nuclear (fission and fusion).
- ◆ Since **Black HC** production will decline over time, the eventual size of the **HC industry** will then depend on supporting **Red HC** energy (through  $CO_2$  re-sequestration or other  $C_{free}$  mechanisms).

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## Section III - What do we need to do?

- The markets for **Black HC** and **Red HC** will be distinct but will influence one another.
- In all other respects they will operate according to normal free market principles.

Each of these markets will naturally deliver a different market price for its HC products.

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## Section III - What do we need to do?

A vitally important aspect of this strategy is that it is **not governments that are setting energy prices** nor **imposing taxation** nor are governments **providing subsidies** to government preferred **technologies**.

*Energy Price will be a pure function of the **MARKETS** with free competition between technologies, suppliers and customers.*

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## Section III - What do we need to do?

- Together, **Black HC** + **Red HC** will determine the eventual size of the HC industry.
- This will depend on the degree to which Cfree HC energy (including CO<sub>2</sub> re-sequestration) is implemented.
- These free market solutions deliver the real cost/value for each commodity.
- This whole new mechanism provides a huge incentive for the HC industry to invest in **Red HC** either by CO<sub>2</sub> re-sequestration or other means (such as CaCO<sub>3</sub>) to achieve energy release from HC without giving rise to CO<sub>2</sub> emissions.

If the HC industry embraces this new mechanism, it will be in control of its own destiny and can grow and prosper.

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## Section III - What do we need to do?

- So whereas presently, we try to limit CO<sub>2</sub> by various types of direct bureaucratic/political control over CO<sub>2</sub> emission and so automatically squeeze the HC industry
- With this alternatively strategy, the free market can accomplish the same result by controlling HC extraction for **Black HC energy** usage (i.e. “free burn” HC).
- In either case, the outcome will be identical, both for anthropogenic CO<sub>2</sub> and for “*free burn*” HC (**Black HC**) production because the **Black HC** and the CO<sub>2</sub> emitted each contain exactly the same number of carbon atoms.

HC + Oxygen = **Energy** + Water + Carbon Dioxide

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*1. Organisationally, this would only effect < 100 producing countries and a similar number of HC producing companies.*

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HC + Oxygen = **Energy** + Water + Carbon Dioxide

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## Section III - What do we need to do?

- Presently, the HC industry remains (amongst) the most powerful in the world.
- It has huge capital investment resources and huge cash flows, banking and government support
- **It is probably the only industry that could accomplish the de-carbonization of the world in a realistic time frame.**
- It can do this within a ***Black/Red HC energy*** mechanism and a normal competitive market framework which preserved its market penetration

**The HC industry could save the world!**  
**The *Black/Red* mechanism could save the HC industry!**

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## Section III - What do we need to do?

### Managing the CO<sub>2</sub> decline

- The **Red HC** market is free except that it can only be sold to certified users.
- The key to success is the design of the **Black HC** market.
- Total **Black HC** production must fall to essentially zero by (say) 2100

A very important aspect, is the way in which that downward trajectory to zero is controlled

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## Section III - What do we need to do?

The HC markets comprises all forms of HC (gas/oil/coal)

The **Black HC** markets deal only in HC for accredited purposes.

However, a free for all with the most powerful customers grabbing all of the **Black HC** market availability would not work in the interests of the world.

Some priority structuring would therefore be necessary:

- Some uses of HC are more amenable to substitution than others
- Some types of HC are more amenable to substitution than others

Nevertheless competition for the use of **Black HC** can and would have to be managed



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## Section III - What do we need to do?

So, market competition for **Black HC** between now and its probable extinction (in c. 2100?) has to be managed

Many ways can be designed to achieve this market competition.

One suggestion could be:

- **Black HC** will fulfil its role in meeting essential market demand according to overall quotas for defined purposes, determined by the perceived absence of viable alternatives still existing at intermediate dates along the overall downward trajectory until its extinction.
- Actual HC users can then bid for segments of this reducing market demand at points (up to 20 years) into the future.

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## Section III - What do we need to do?

- Successful bidders would then purchase HC on the open **Black HC** market(s) up to their annual purchased quota for their defined purpose(s) and use it to fuel their business intentions.
- These would have to be accredited purposes within the defined purpose of the quota they sought/acquired.

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## Section III - What do we need to do?

This **Black/Red HC** scheme is just one way to square the circle. ---- Others will emerge.

Nevertheless - to meet **our critical aim**, the eventual outcome has to be approximately ZERO Black HC, in order to have approximately ZERO CO<sub>2</sub> emissions.

The question is, **if and how** we get there?

Do we do by persevering with CO<sub>2</sub> emission control schemes? or:

Do we do it through a structured Free market schemes such as **Black/Red HC**?



END