A Texan oil expert is the inspiration for this talk

- In 1956, a Texan oil geologist called Marion King Hubbert, made a startling prediction
- Oil production would peak in the US between 1966 to 1971
- No one took him seriously
- But his prediction came true in 1970 – the greatest commodities prediction of all time
- He also suggested that world oil would peak in another generation
- I suggest it’s time to start asking if this could happen to coffee
Onwards and upwards
No cause for alarm?

Disaggregating the world curve
Total production is quite linear – but the components are highly non-linear
Oil and coffee countries show similarities in composition

<table>
<thead>
<tr>
<th>Production status</th>
<th>Oil*</th>
<th>Coffee**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries increasing</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Countries flat</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Countries declining</td>
<td>30</td>
<td>28</td>
</tr>
</tbody>
</table>

* BP statistical review  
** ICO, FAO, USDA

Coffee production is increasingly concentrated

- Proportion of coffee produced by the top 4 countries (C4) is rising – it’s now over 60%
- When only one C4 country in one year has a problem (e.g. Colombia 2009) this affects everyone
Coffee output is getting more variable (but only a bit)

- Coefficient of variation of top 20 countries is rising
- Top 20 countries now produce more than 95% of world production

10 of the top 25 coffee countries have been declining by 42,000 tons/yr over 20 years

Colombia, Costa Rica, Côte d’Ivoire, DRC, Ecuador, El Salvador, Kenya, Mexico, Philippines, Venezuela
But demand is increasing by ~ 100k tons/year

- Some of the demand is met by increasing yields
- But not enough to account for the rise – and maybe the big increases in yields in Colombia and Brazil are now over
- So where is all the new supply going to come from?
- After all, there is only a finite and declining amount of land suitable for coffee

A problem of perception?
How do you think of coffee production?

- For many people, probably just as an ever rising graph

But this doesn’t give us any intuitive idea of what is really happening
- The above line is a running tally of:
  - [Existing stock] + [Recently planted] – [Eradicated] = Total
The world’s coffee lands are in constant flux

- Currently the industry depends on more new coffee entering production than leaving

Then & now

![Diagram showing coffee lands entering and leaving production]

- Increased loss of coffee lands
The world’s coffee lands are in constant flux

- Currently the industry depends on more new coffee entering production than leaving

Then & now

Laissez-faire future

Far-sighted

Coffee fading away...

- Coffee >> beef, a rational economic decision
- The land is now off the coffee ‘books’
Where exactly is new coffee coming from?

- The statistics are not good enough to tell us how much and where new coffee is coming from
- But some of it is due to natural habitat destruction including deforestation (have some data & anecdotal evidence)
- It’s likely that at least 50,000 ha of new production is coming on stream each year
- If only a half (25k ha) is from deforestation, this could mean an extra carbon release/loss of 5 million tons carbon/yr
- This could be as much as one third of coffee’s total yearly carbon footprint
- If the coffee industry is serious about sustainability, it needs to think seriously about its **global** carbon footprint

Re-conceptualizing coffee production away from the idea of a limitless frontier

- Coffee production is increasingly concentrated
- And it’s not a static stock, it’s turning over
- This flux will increase in the years to come as the climate changes and human populations rise
- But new lands will be limited in the future
- We need to get a much better grip on this process
We need better data:

1. To keep a careful eye on the *supply/demand* problem
2. **Carbon**: the industry wants to reduce carbon footprint – just selling small amounts of carbon neutral coffee is not enough if deforestation is getting worse
3. Hence any general **claims to sustainability** depend on having a transparent and accurate picture of world coffee
4. Coffee has shown **leadership in sustainability** but this could be jeopardized by unsustainable increases in production flux

Taking the temperature of global sustainable coffee

- Too “hot & new” - not sustainable
- Too “cold & old” - not sustainable

- Is it time to re-think what “sustainable” means?
Recommendations 1

We need better statistics:
- We simply don’t know enough about the coffee lands that are the foundations of a $90bn/yr industry
- It’s crazy that we know far more about a consumer of coffee in say, Milwaukee, than rate of coffee land change in producer countries

Quite major variance between production estimates

- We need to improve accuracy of estimates
Very poor data on global coffee area

- We need to gather more types of data – not just volume

Recommendations 2

- We need to start looking at sustainability of the coffee industry on a much larger scale than hitherto. Only by calculating global balances can we start to see the true costs of coffee to the global environment.
- By so doing, better understand the factors likely to affect future global production.
- E.g., if we started to look at coffee in this way, we might concentrate more on improving carbon balance by focussing on coffee yields and thereby reduce the need to deforest more land.
Recommendations 3

- The single most important thing that could be done to improve global sustainability of coffee is to transform African coffee production into a modern and progressive industry, because of the three continents, Africa has by far the lowest yields.
- A coffee industry that calls itself sustainable and that has become a global leader in this endeavour through use of a tree that evolved in Africa, should surely not allow this stagnation to continue.
- The answer is primarily through investment in research, extension and technology, and Brazil/Colombia have shown the way.
- Once Africa loses its coffee industry, it will be very hard to get it back again.

Will coffee peak?

- Yes, but probably not soon
  - Part of “Peak Everything”: by the end of this century it seems increasingly likely that the world will be 4°C warmer than today. But this is a global average, many tropical countries will be up to 6°C hotter.
  - This will make coffee production contract to fewer places, e.g. S Brazil, Argentina, but it’s difficult to say with precision
- Could coffee be especially susceptible to peak early?
  - Yes, because of current concentration of production, more unpredictable climate, need for food security in the tropics as well as the desirability of coffee lands for other crops
More reasons for production to go down than up

<table>
<thead>
<tr>
<th>Going up</th>
<th>Going down</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increasing demand causes rising prices</td>
<td>• Rising food prices and biofuel crops give farmers more lucrative options</td>
</tr>
<tr>
<td>• Leads to new lands coming on stream</td>
<td>• Governments may subsidize food security campaigns</td>
</tr>
<tr>
<td>• Large scale rehabilitation projects from the public/private sector</td>
<td>• Poorest countries experience increasing political strife that leads to more disruptions in supply – western governments and UN won’t help enough</td>
</tr>
</tbody>
</table>

- Lower altitudes increasingly too hot/dry/wet to grow coffee
- Population rise & city spread eats up coffee lands
- More chaotic climate in major coffee countries leads to periodic shortages, price rises which reduces demand
- Effective REDD schemes start reducing supply of coffee lands from deforestation

Lead indicator of peaking?

- During the peaking process, amplitude of production will start to increase as weather patterns become more unstable.
- We may already be seeing this in some countries, such as Nicaragua, Tanzania
- Hence an early warning sign of peaking is increased variation
Waiting for the Black Swan?

- What will really happen?
- No one knows, but we are not really trying hard enough at the moment to figure it out
- Or even to try to shape our thinking and formulate the right questions to ask

Peak sustainable coffee...already reached?

- Sustainable coffee certifications have grown over 10 years, from 1% to now about 8% of total production
- But coffee production has also grown, by about 10% in 10 years
- So the area of uncertified coffee remains about the same—and because of deforestation and diversification, coffee’s carbon footprint must be getting bigger
- Can you claim that sustainability of coffee is improving if the carbon footprint is getting worse?
- Unless sustainable coffee certifications accelerate, they will start to decline as a proportion of world coffee as coffee production flux increases
At the global level, sustainable schemes to date have had little effect

- Ten years ago, sustainable coffee was ~1% of world coffee

- Now, sustainable coffee is about 8% of world coffee
At the global level, sustainable schemes to date have had little effect

- But, during that time, world coffee supply has grown by ~10%
So, if we are not careful...

- Rate of certification of coffee will become less than the rate of change of coffee lands
  \[
  \frac{dC_{\text{ert}}}{dt} < \frac{dL_u}{dt}
  \]
  
- And in the end, for true sustainability, it’s the land what matters, not the crop

Finally: it’s an ideological battle

- It’s clear from recent financial problems, that we have been living in a fool’s paradise for some time
- For Peak Coffee, you need to decide which fundamentals you believe in
- This battle can be personified by two men:
What sort of a coffee future?

• As personified by Alan Greenspan, neoliberal ‘regulation lite’ champion
• But, by Oct 2008 - in a state of “shocked disbelief,” because “the whole intellectual edifice” had “collapsed.”

  • Greenspan (interrogated by Waxman), ‘fessed up:
    “I found a flaw in the model that I perceived is the critical functioning structure that defines how the world works, so to speak.”

What sort of a coffee future?

• Or as personified by Hubbert: a scientist
• He was not just an oil jock who made a lucky guess
• But someone with deeply analytical powers who was scathing about the world economic system
• “The world’s present industrial civilization is handicapped by the coexistence of two universal, overlapping, and incompatible intellectual systems: the accumulated knowledge of the last four centuries of the properties and interrelationships of matter and energy; and the associated monetary culture which has evolved from folkways of prehistoric origin.”
Matter and Energy
the stuff of life

- So how does the coffee world work- at the most fundamental biophysical level?
- Are we happy with our current state of data and understanding, where we let the market find new coffee?
- Or will we too one day, like Alan Greenspan, find a fatal flaw?
- As things stand, at the field level, we are still in a Greenspan mindset, with:
  - Lack of investment in many countries (esp. Africa)
  - Weak and atomized coffee support institutions
  - No real planning for our very uncertain future
- We simply must do better

Take home questions
What is it to be?

- Are you ‘Greenspan’ or ‘Hubbert’ on coffee?
- Laissez-faire?
- Or plan carefully for the future?
- The latter means substantial investment and increased institutional support
- What responsibilities should international, national, NGO and private institutions take?
- But whatever you decide, please don’t think that somehow these fundamental questions are all going to be taken care of
- Because the institutions that could do this, have been deliberately weakened and hollowed out
Thank You
Anacafé
&
ICO!
for being such gracious hosts

“Intellectual traditions have been born from the study of coffee; some have been overturned by it. The industry has shaped fields of learning.”

[Robert Bates  ICO World Conference 2001]