



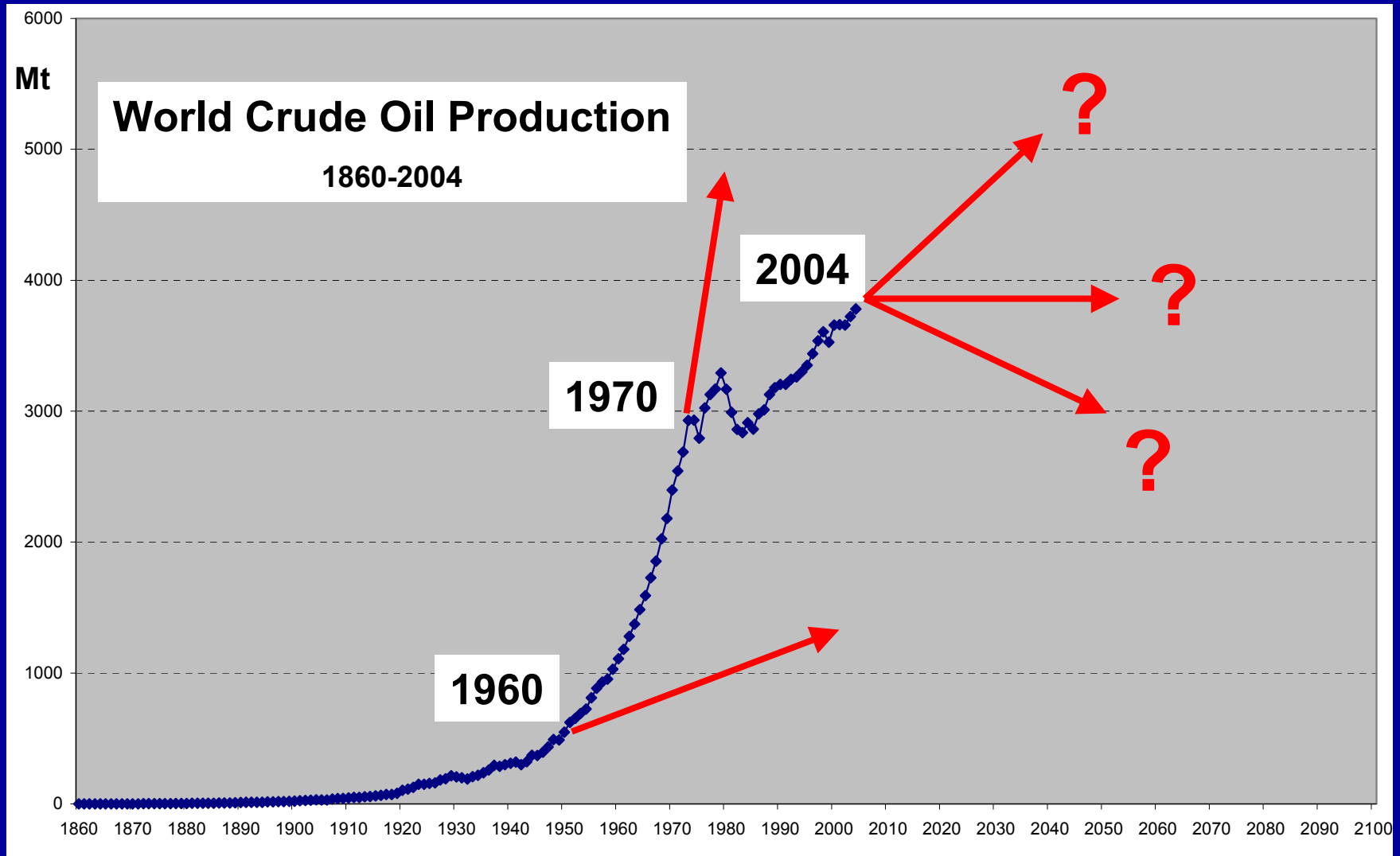
Third International Workshop on
Oil & Gas depletion
Berlin, May 25-26, 2004.

« A dynamic approach of oil production »
P. Alba (Consultant) & O. Rech (Economist - IFP)



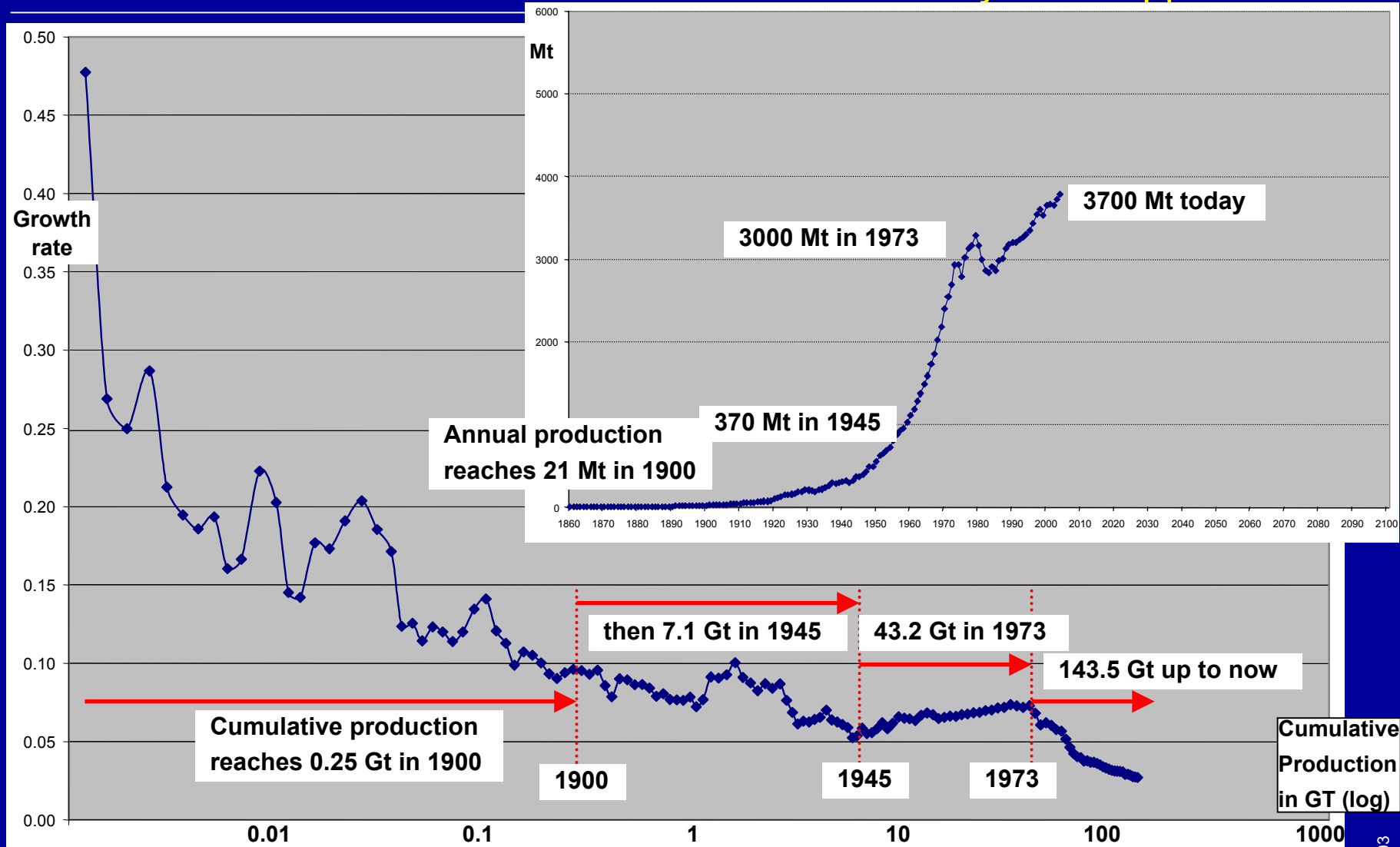
Estimating the peak oil through a dynamic approach

From annual production time series...



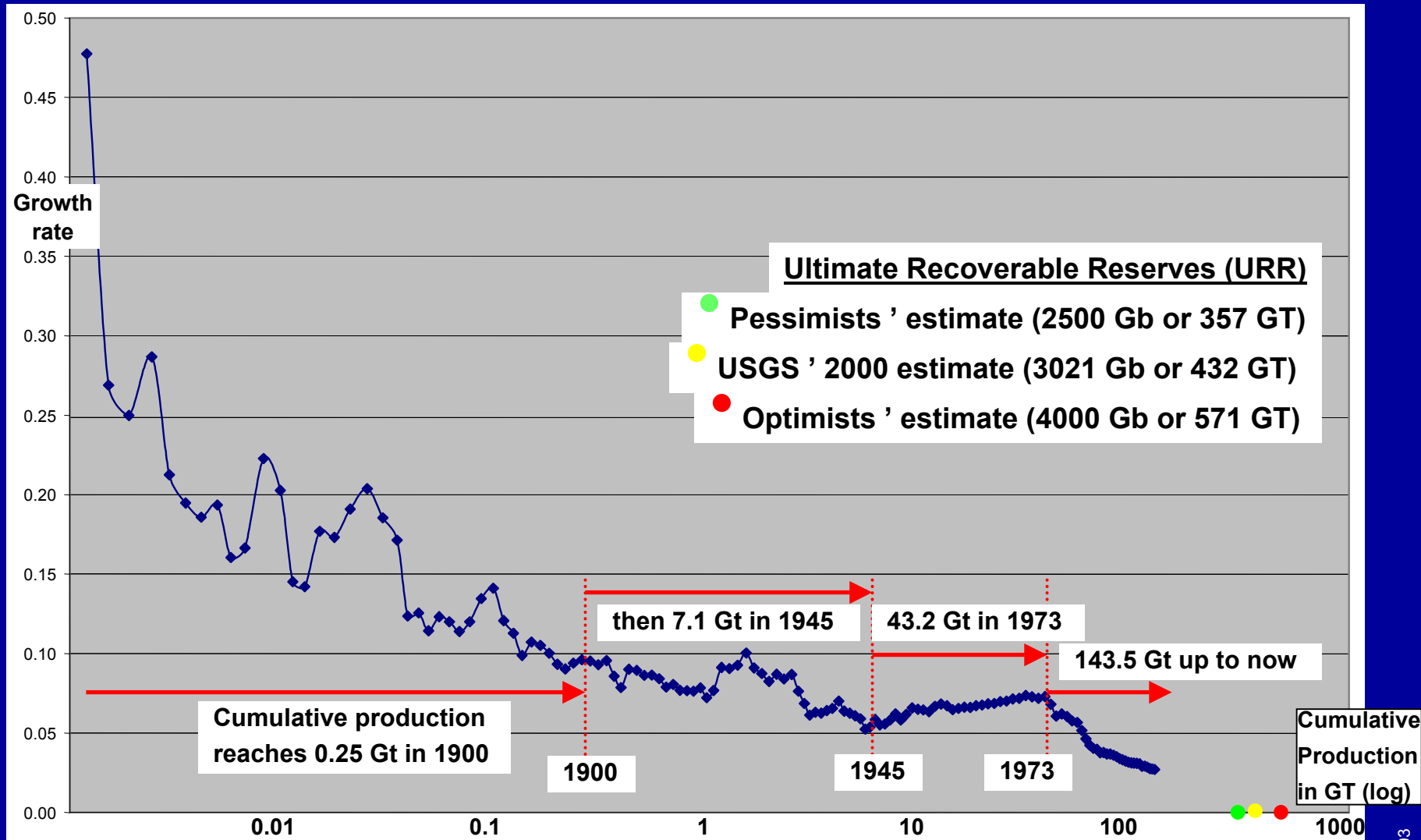


Estimating the peak oil through a dynamic approach ...to a dynamic approach...



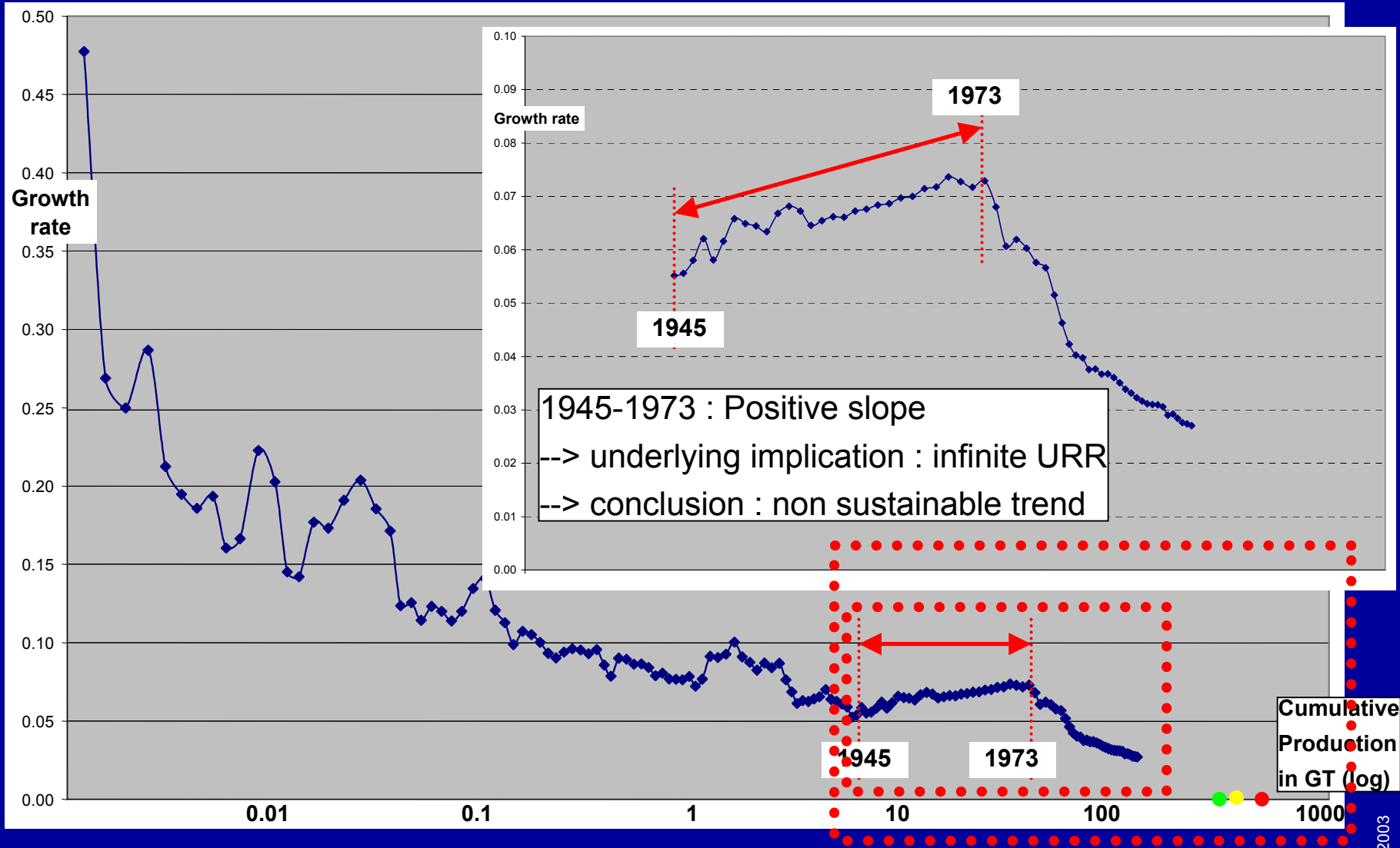


Estimating the peak oil through a dynamic approach ... by establishing a link between cumulative production and URR





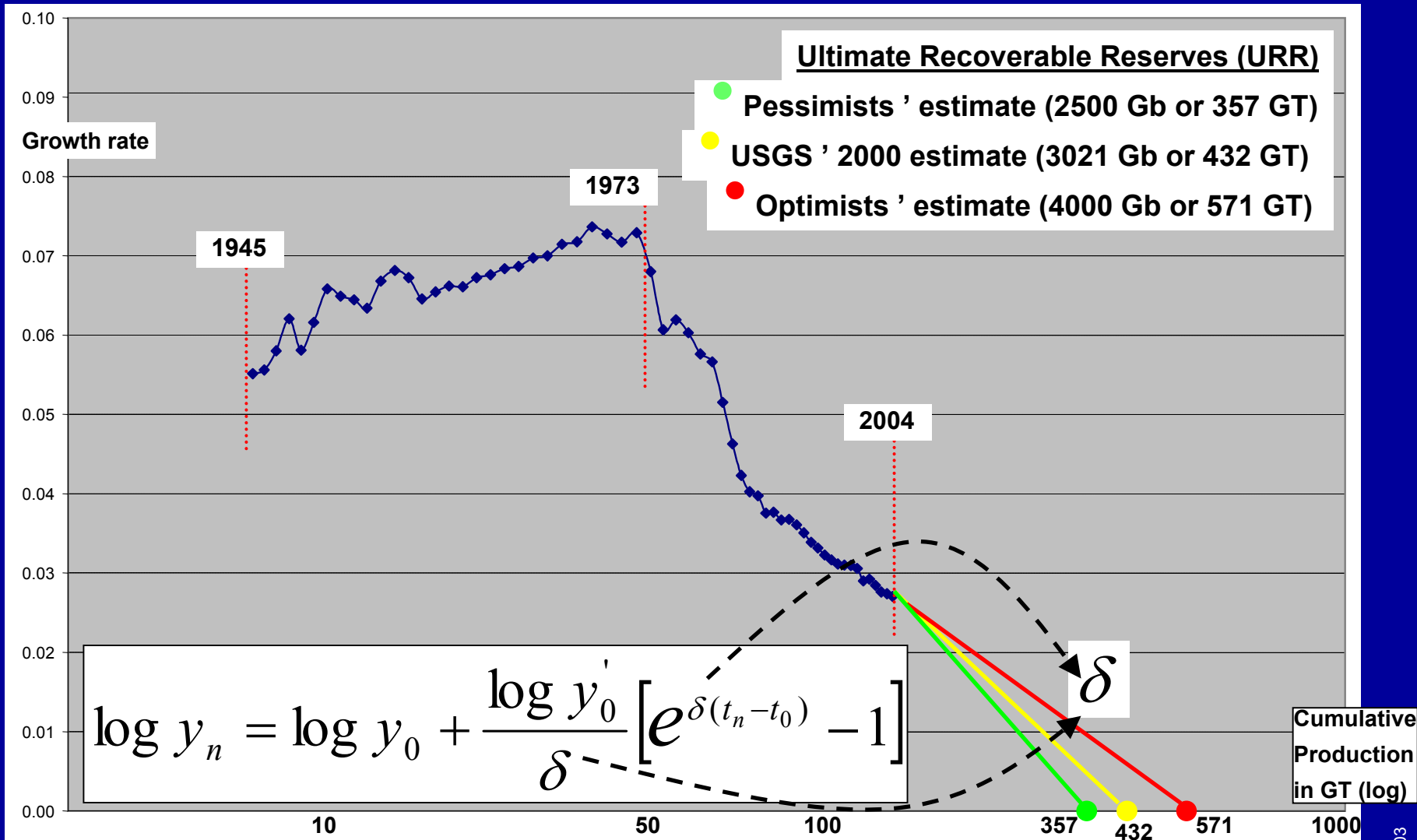
Estimating the peak oil through a dynamic approach ... by establishing a link between cumulative production and URR





Estimating the peak oil through a dynamic approach

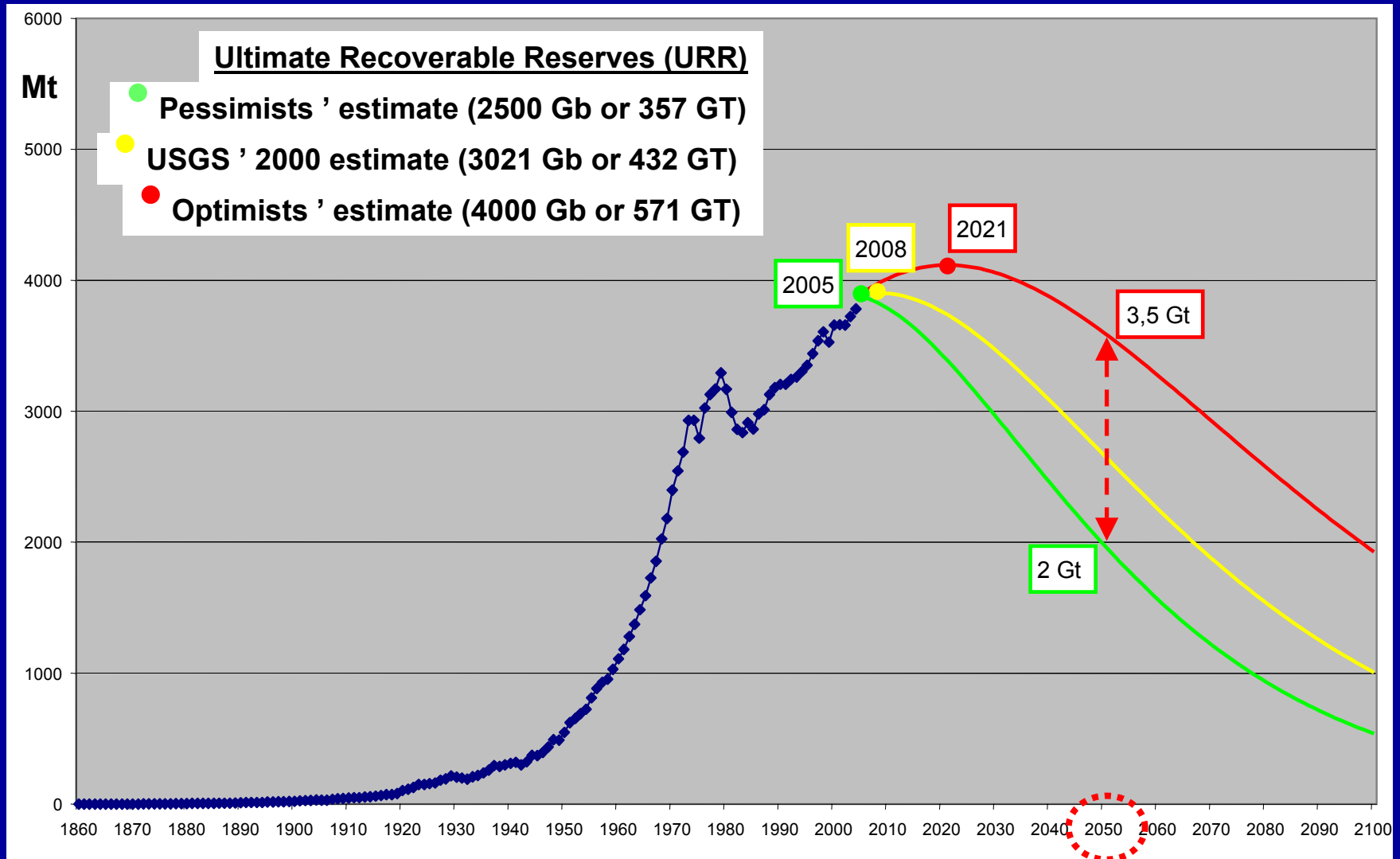
1/ linking URR estimate to cumulative production





Estimating the peak oil through a dynamic approach

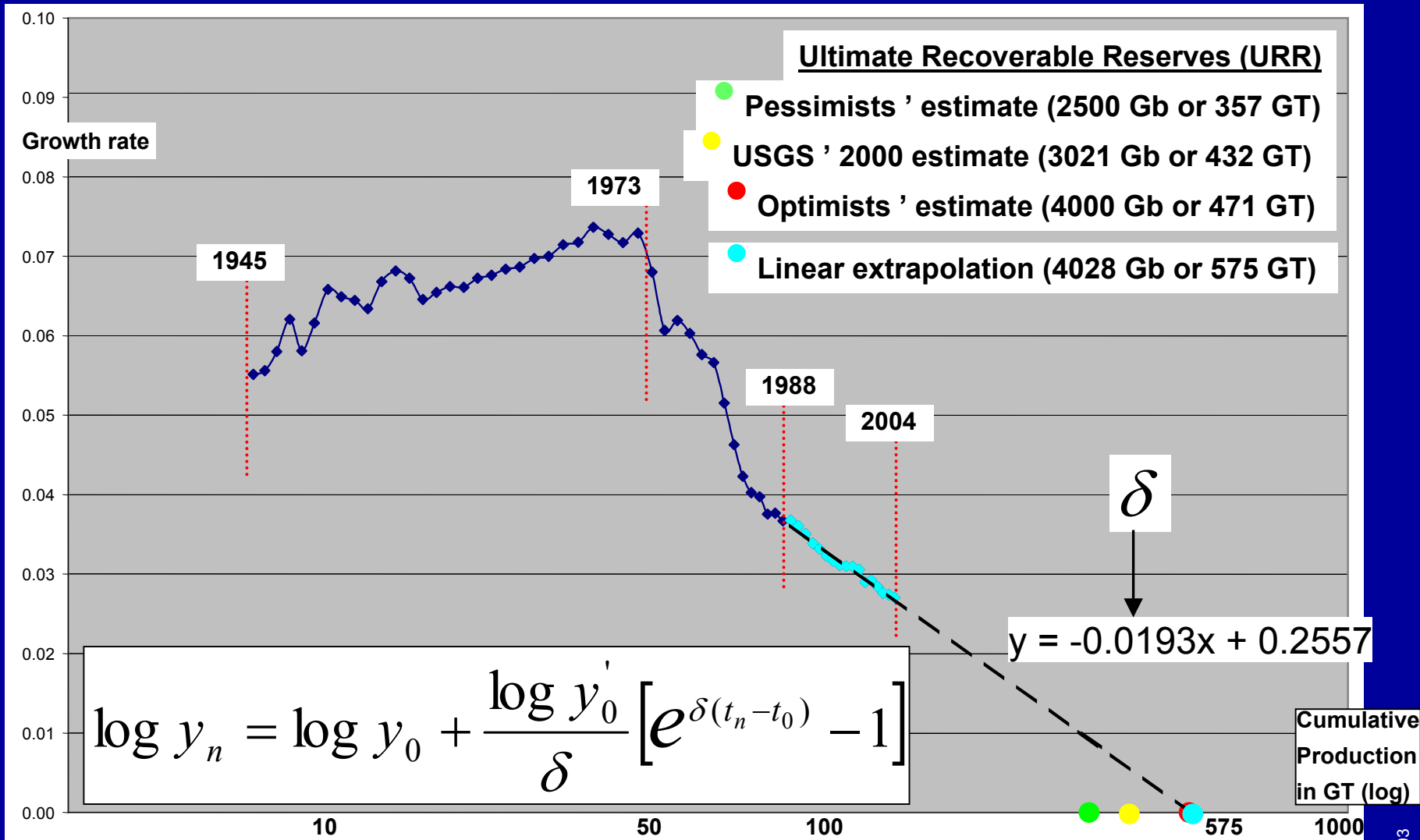
1/ linking URR estimate to cumulative production





Estimating the peak oil through a dynamic approach

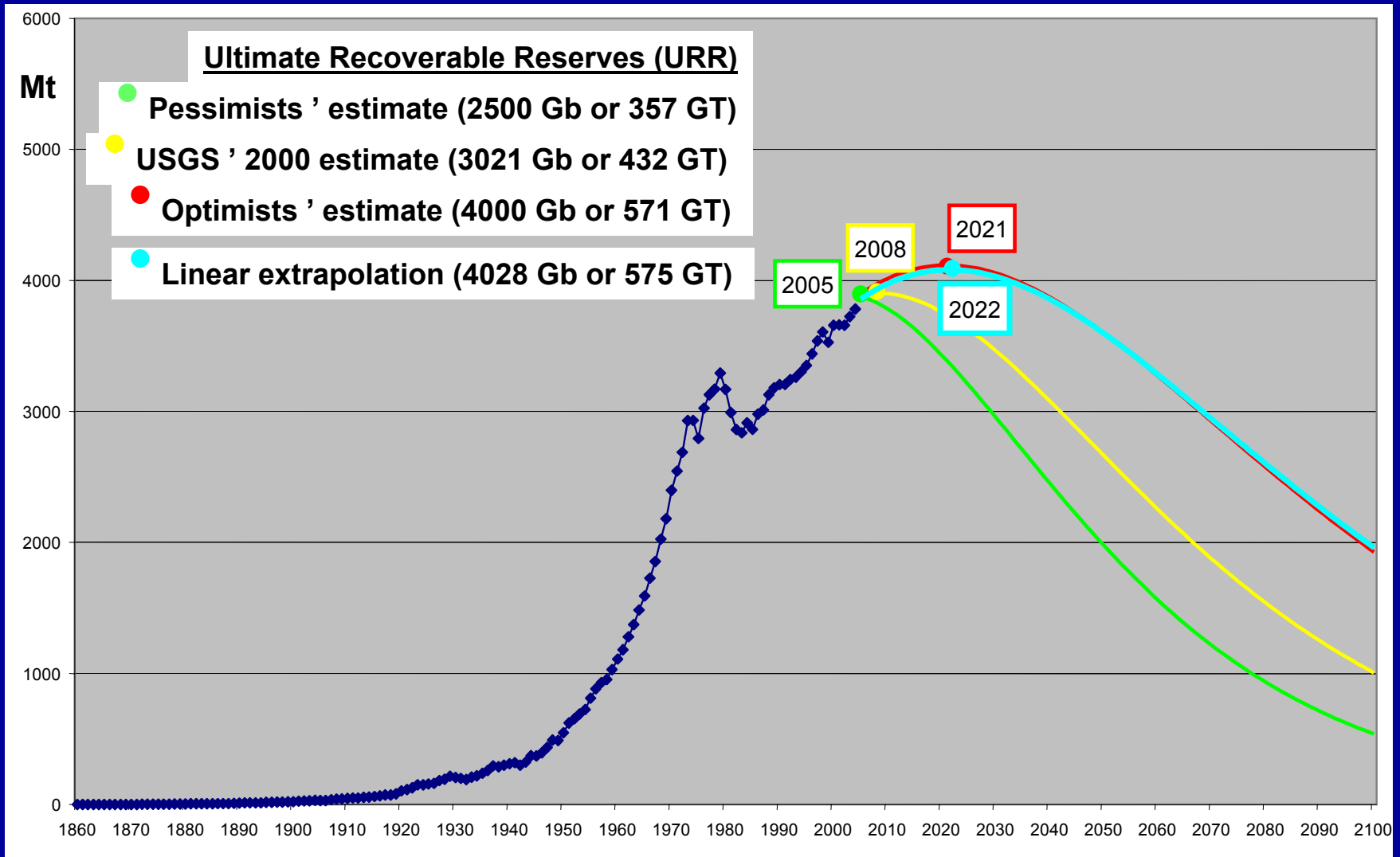
2/ extrapolating cumulative production to estimate URR





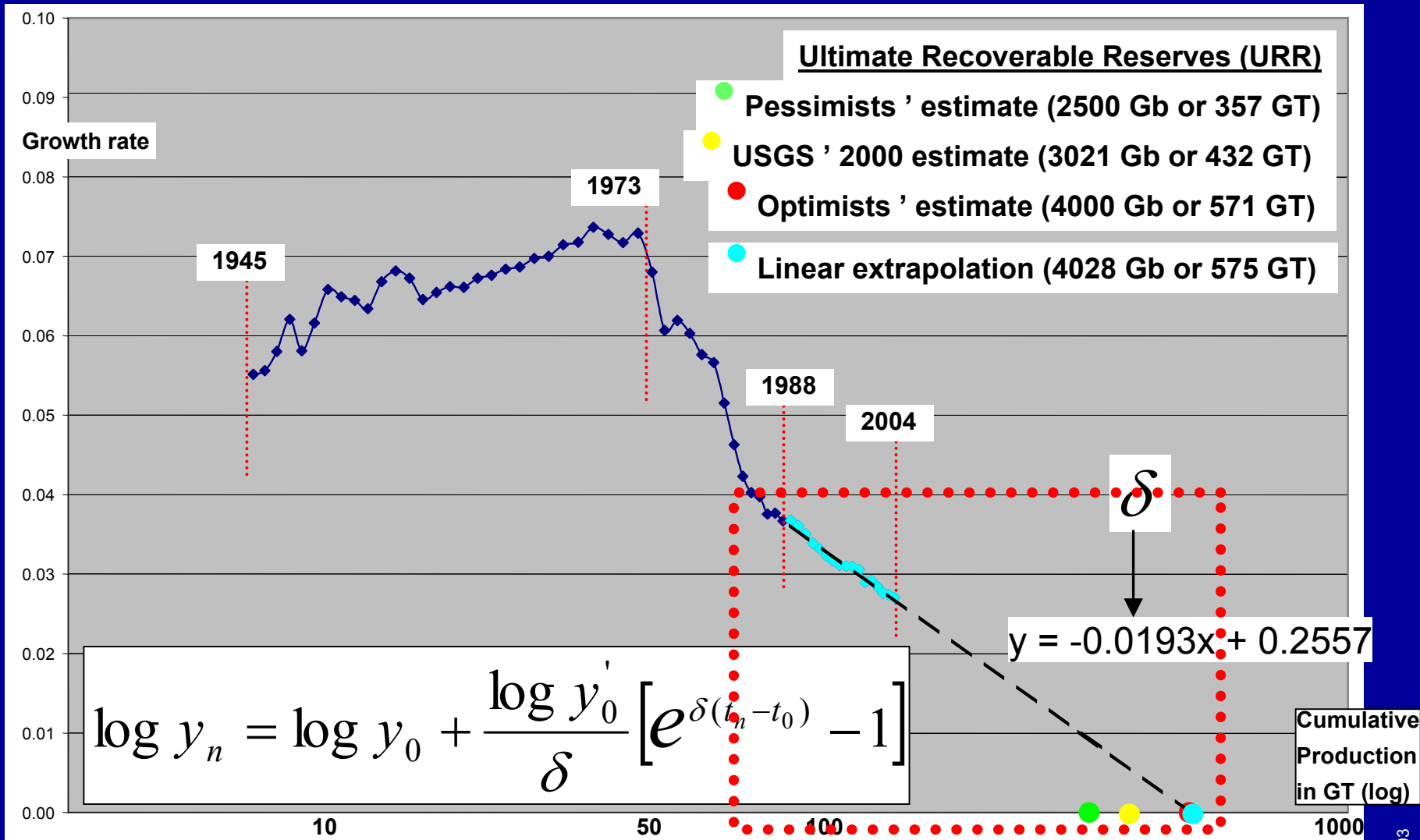
Estimating the peak oil through a dynamic approach

2/ extrapolating cumulative production to estimate URR



Estimating the peak oil through a dynamic approach

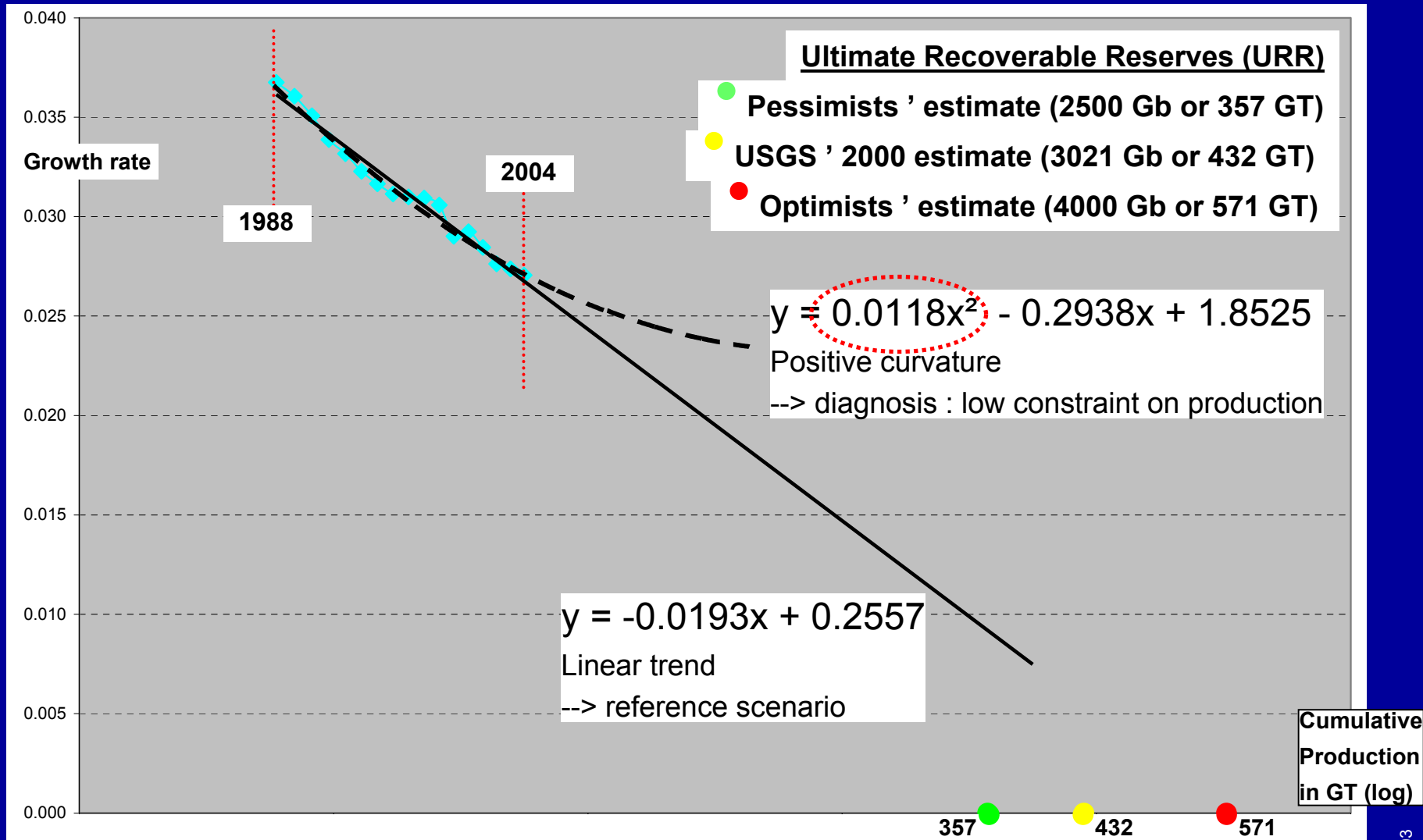
2/ extrapolating cumulative production to estimate URR





Estimating the peak oil through a dynamic approach

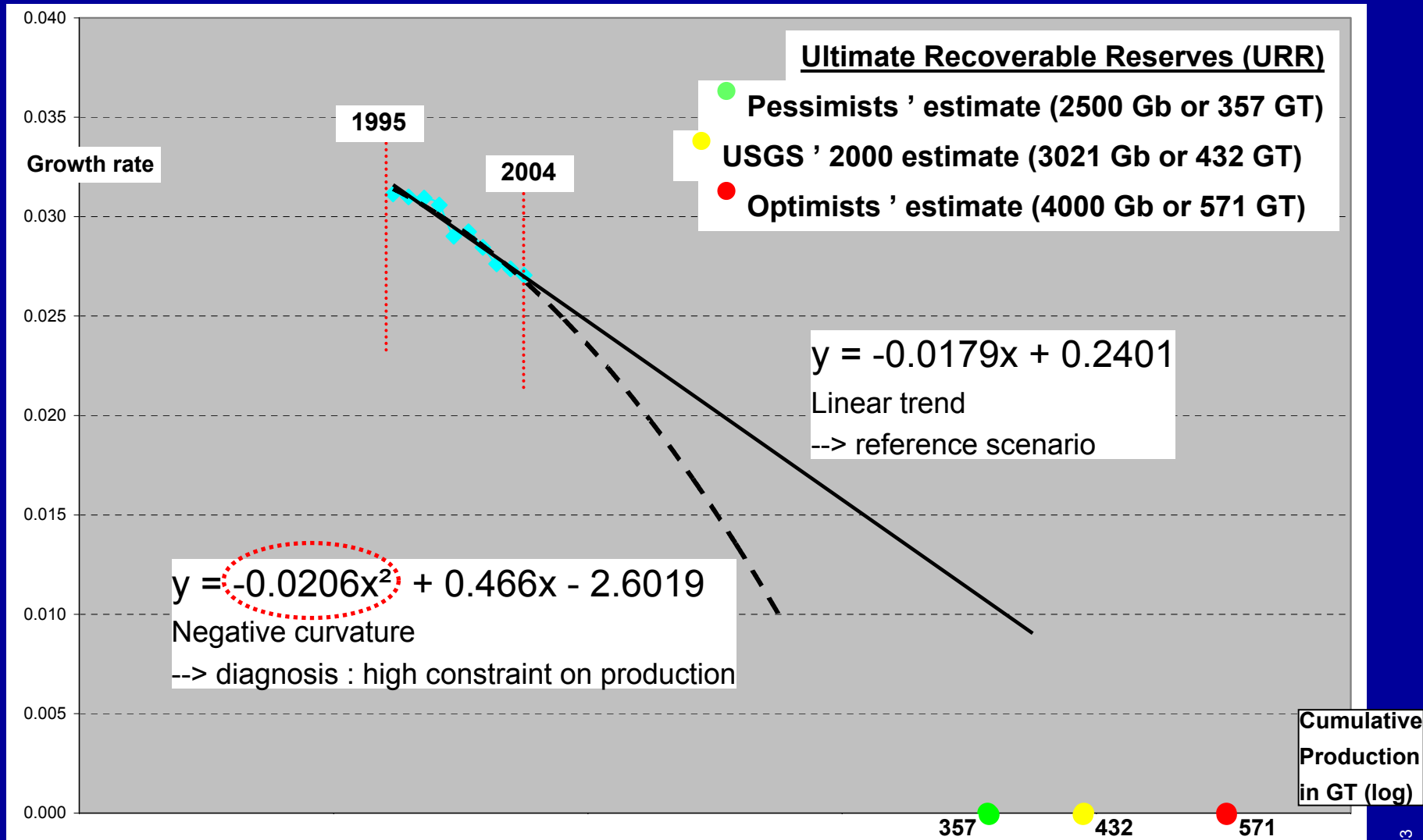
3/ beyond cumulative production linear trend





Estimating the peak oil through a dynamic approach

3/ beyond cumulative production linear trend





Estimating the peak oil through a dynamic approach

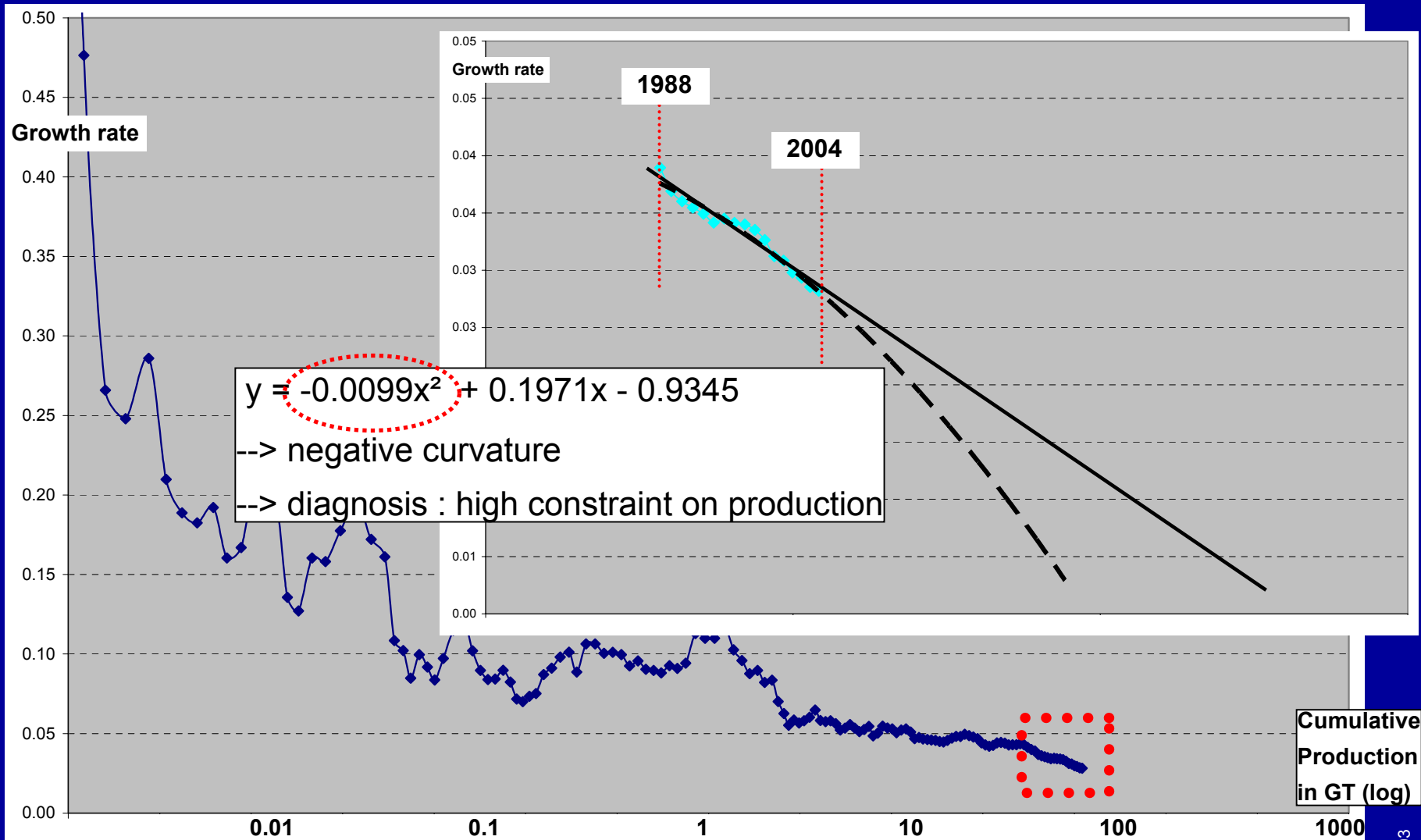
4/ making a diagnosis : from total world production...





Estimating the peak oil through a dynamic approach

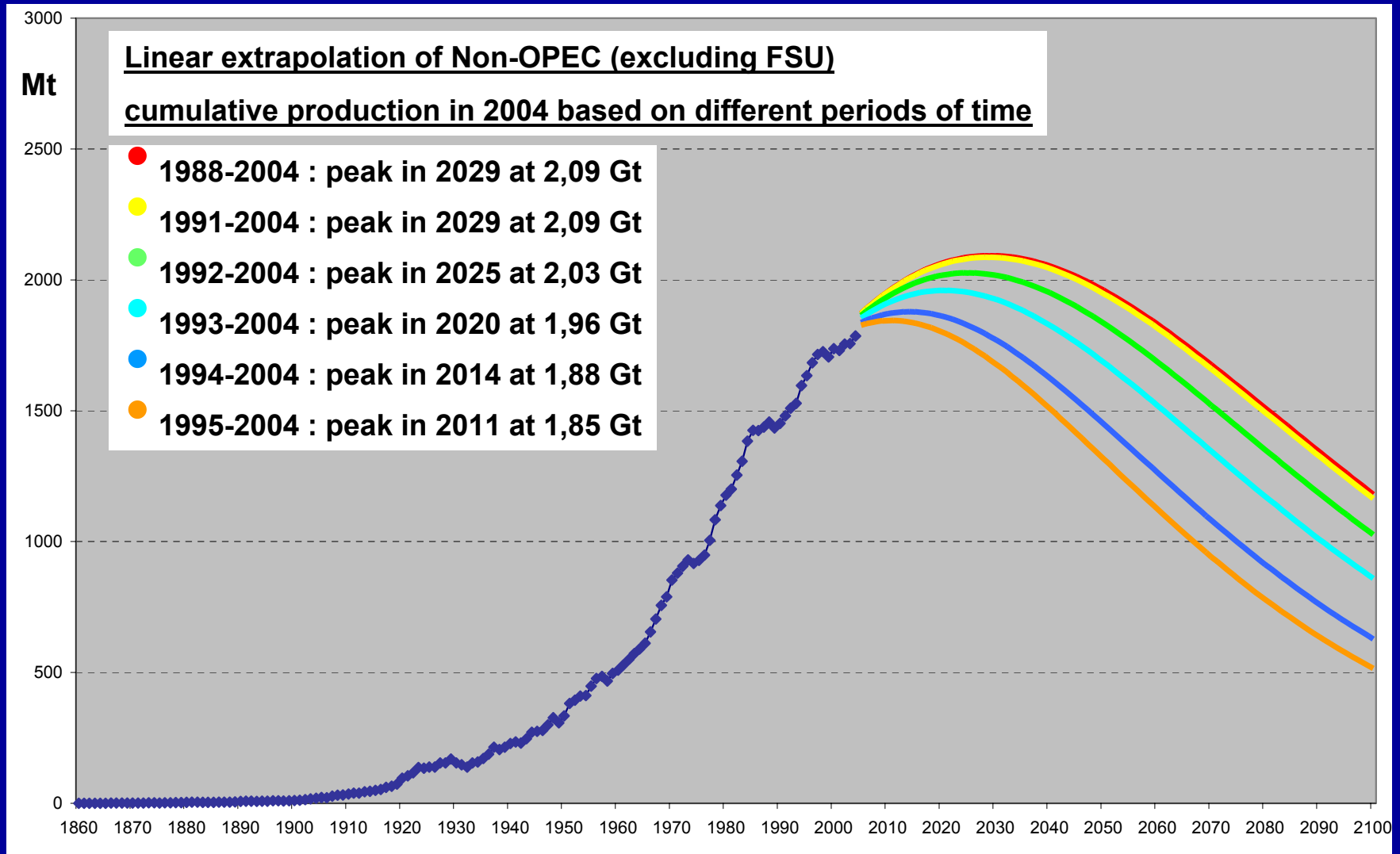
4/ ... to its components : Non-OPEC (excluding FSU)





Estimating the peak oil through a dynamic approach

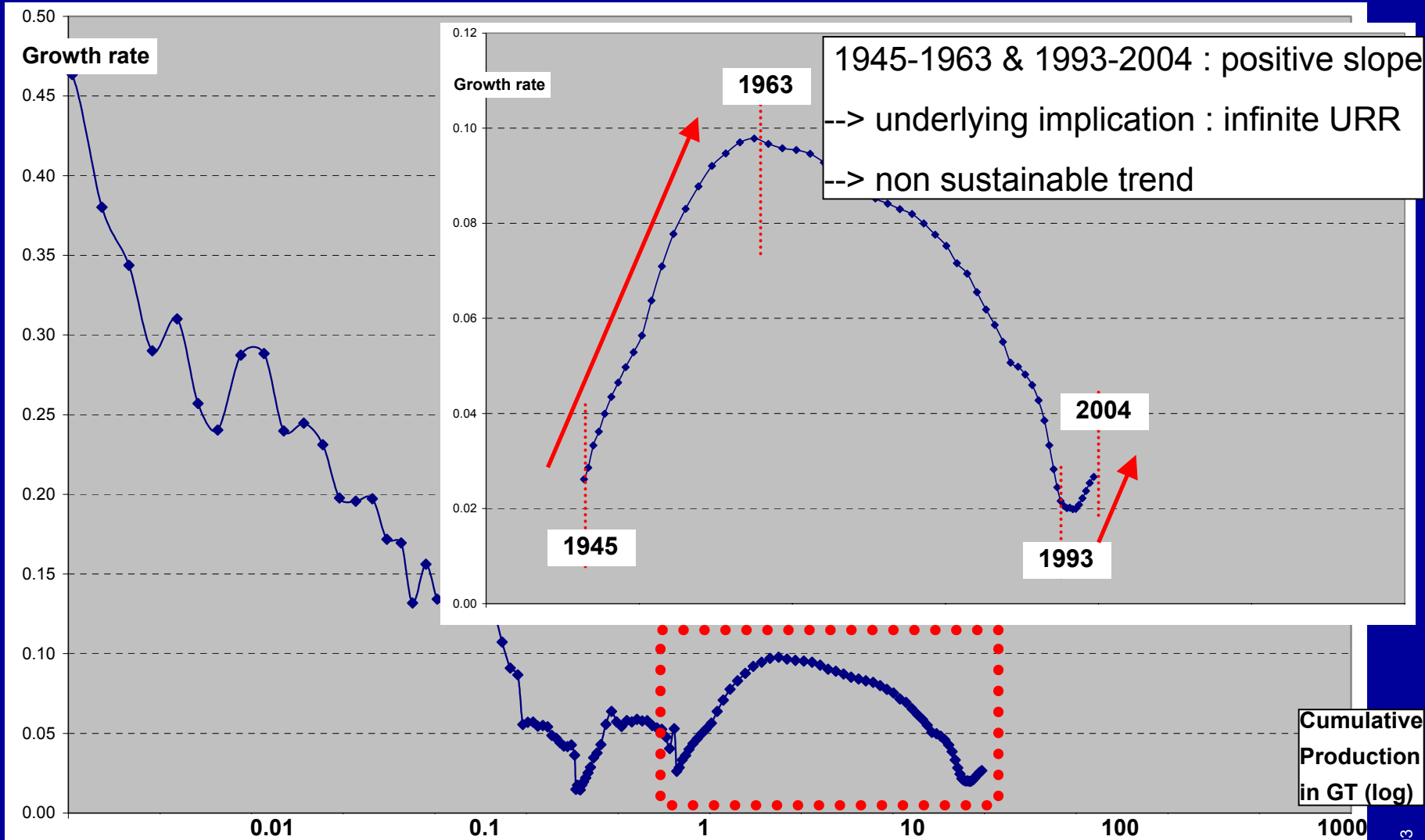
4/ ... to its components : Non-OPEC (excluding FSU)





Estimating the peak oil through a dynamic approach

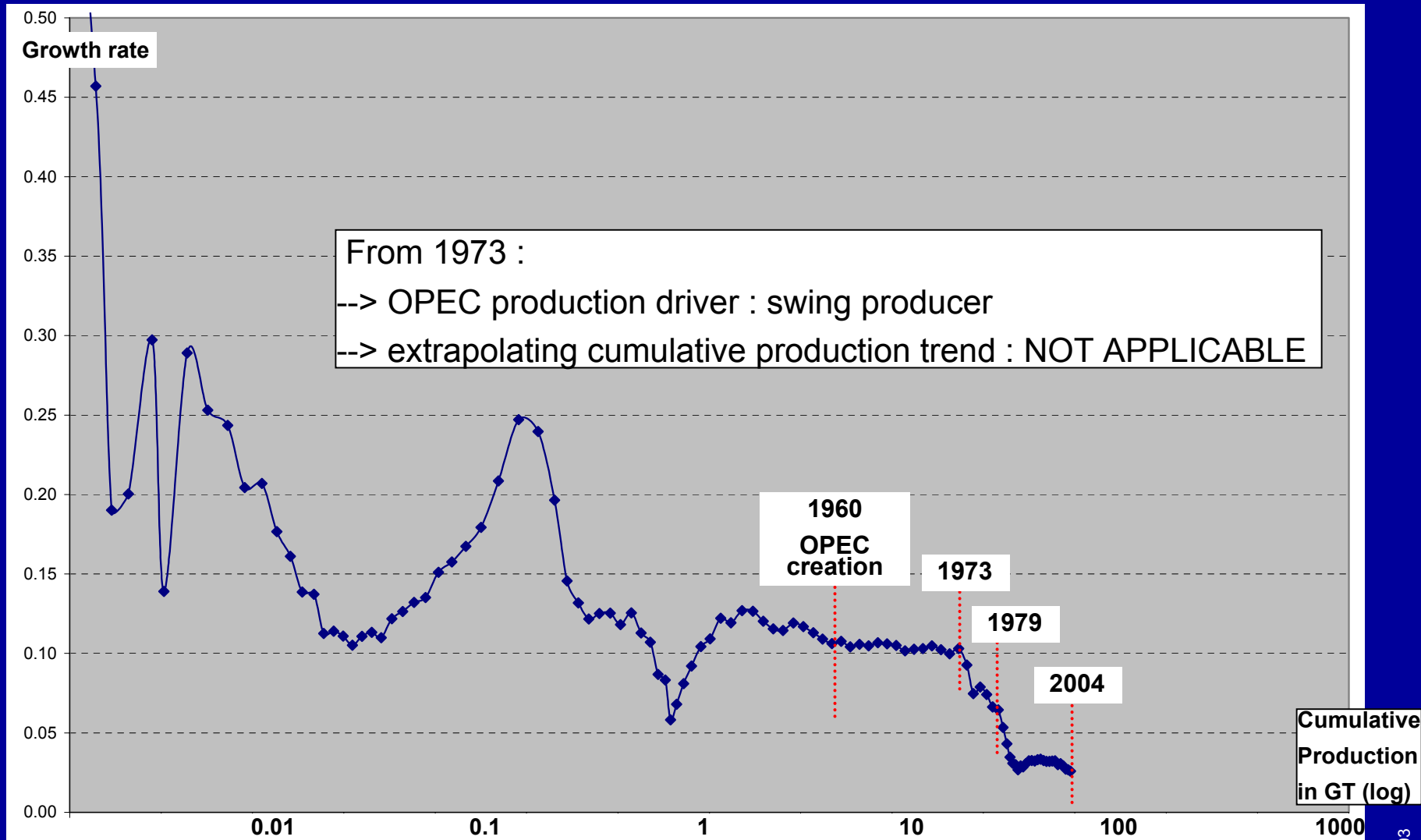
4/ ... to its components : FSU





Estimating the peak oil through a dynamic approach

4/ ... to its components : OPEC (11 members)





Estimating the peak oil through a dynamic approach

1/ Conclusions and uncertainties

- **Dynamic approach :**
 - not a crystal ball
 - not a substitute to geologists ' expertise
 - time by itself does not explain anything
 - considers 3 dimensions (position - speed - acceleration/deceleration)
- **Aims to provide an analytical framework to evaluate :**
 - the consistency of URR estimates versus cumulative production
 - the consistency of production scenarios versus long term trends
- **But dynamic approach not appropriate :**
 - for past FSU production (planned economy before 1990s)
 - for OPEC production (swing producer since 1973)



Estimating the peak oil through a dynamic approach

2/ Conclusions and uncertainties

- The future of oil :
 - Pessimists too pessimistic...
 - Actual linear trend consistent with optimists 'assumptions
 - 2050 : world crude oil production still above 2000 Mt
- But supply security concerns and geopolitical implications arise before world peak oil :
 - Non-OPEC production slowing down (peak production before 2020s)
 - Actual FSU production not sustainable (peak production behind us)
- The question of world peak oil :
 - High uncertainty related to the date of world peak oil...
 - ... and to OPEC potential supply over the long term



Estimating the peak oil through a dynamic approach

Sources and Bibliography

- **Sources of data :**
 - 1860 - 1970 : « World energy production 1800-1985 », B. Etemad & J. Luciani, CNRS & CHEI, Geneva, 1991.
 - 1971 - 2004 : International Energy Agency - Energy Statistics Division & Oil Market Report.
- **Oil and Gas Science and Technology Journal**
 - « A contribution to the methodology of long term energy scenarios », vol. 57, n°4, 2002.
 - Downloadable from <http://revueogst.ifp.fr/>
- **Forthcoming publication on dynamic approach methodology.**



Estimating the peak oil through a dynamic approach Non-OPEC (excluding FSU and USA)

