Uncertainties in estimating remaining recoverable resources of conventional oil

Christophe McGlade
University College London, London WC1H 0HY, United Kingdom
christophe.mcglade09@ucl.ac.uk
7th July 2010

Abstract
Numerous uncertainties exist in estimating the remaining recoverable resources of conventional oil held by countries. These uncertainties include: the use of ambiguous definitions and inclusion of different subcategories of conventional oil by reporting sources, the inclusion of political reserves in 1P reserve estimates, the inconsistent and unclear effects of aggregation of field-level 2P reserve data to country and regional estimates, the anticipated volume of undiscovered oil, and the nature and extent reserve growth and its allocation to individual countries. These uncertainties are analysed and literature discussing them reviewed. Industry and academic estimates for reserves, undiscovered oil and reserve growth are examined and allocated to individual countries and it is concluded that it is possible to estimate global remaining recoverable resources, but only with large errors. The procedure for this encompasses a method for incorporating USGS undiscovered oil data released since its 2000 World Petroleum Assessment taking account of discoveries since 1996, accompanied by a procedure for allocating remaining reserve growth to individual countries.

1 Introduction
A significant volume of work has previously been carried out analysing estimates of remaining recoverable resources of conventional oil. Unfortunately this is a contentious area and analysis is often pigeonholed into either an ‘optimistic’ or ‘pessimistic’ camp (based upon views of long term supply availability), with work in both camps exposed to polarised criticism often based upon selective or biased evidence. This area is therefore not often assessed, at least in the public arena, in a methodical, rigorous and scientific manner.

The goal of this paper is therefore to analyse and review any uncertainties in determining estimates of remaining recoverable resources of conventional oil held by individual countries (not regions) in an objective manner, and, if possible, produce a country-level database of these resources.

The recent work of Sorrell et al. (2009) set out to examine the evidence discussing the likelihood for a near term peak in conventional oil production before 2030. This paper builds on that work, but does not discuss production profiles and hence does not analyse ‘peak oil’ to any degree, however it does draw on evidence presented both by the ‘optimists’ and by the ‘pessimists’. 