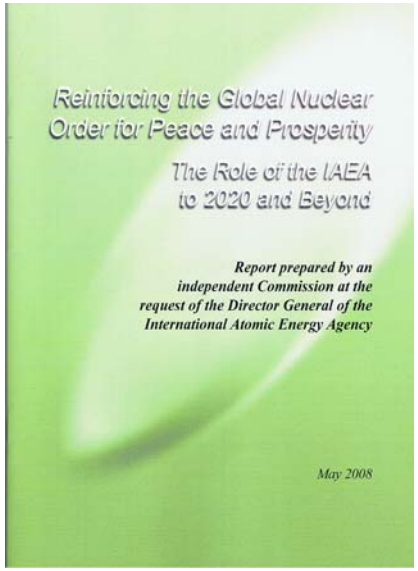
第３２回原子力委員会
資　料　第　１　号

“The Role of IAEA to 2020and Beyond

Report prepared by an independent Commission
at the Request of Director General of IAEA
May 2008



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Projections for worldwide nuclear power

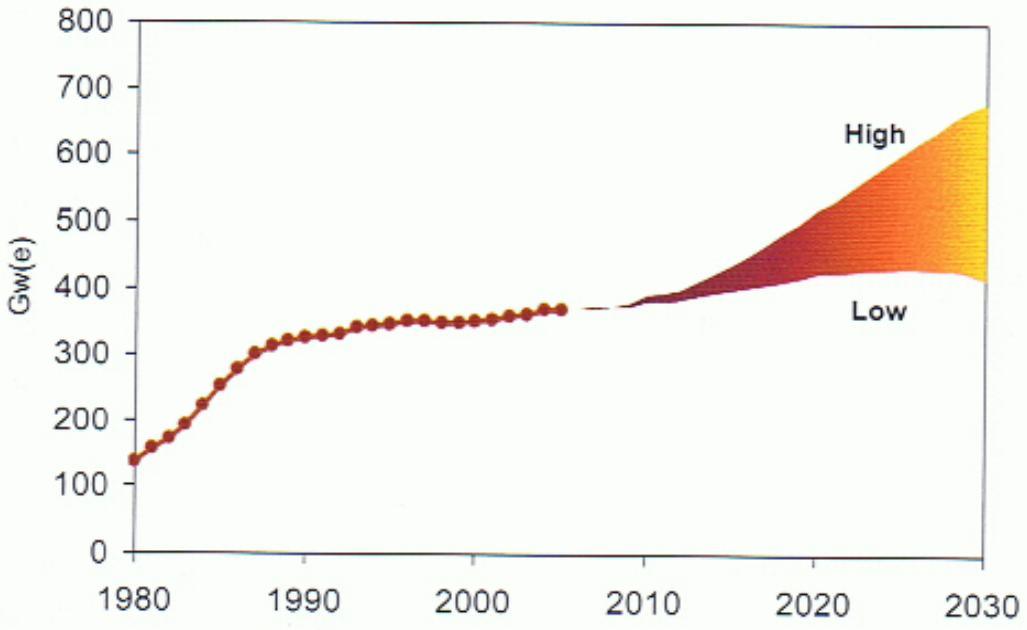


FIG. 1. Projections for worldwide nuclear power capacity up to 2030.

In 2006, the IAEA published updated projections on global nuclear power development that show a significant potential increase in global nuclear power capacity up to the year 2030 (see *http://www.iaea.org/OurWork/ST/NE/Pess/RDS1.shtml*). Figure 1 shows updated low and high projections for worldwide nuclear power capacity. The low projection includes only firm plans announced by governments and power utilities for the construction of new nuclear power reactors, for lifetime extensions of existing reactors and for retirements of reactors. Even in this low projection, global nuclear power capacity will increase to 414 GW(e) by 2030. In the high projection, which incorporates additional power reactors suggested by long term government and utility plans, global nuclear power capacity is estimated to reach 679 GW(e) in 2030.

IAEA Annual Report 2006, p21

•Recommendations for a stronger IAEA

•The Commission's recommendations on actions to reinforce the global nuclear order, including actions to be taken by the IAEA, are offered in the preceding sections of this report. Recommendations for strengthening the Agency are offered below.

• The unique scientific and technological capabilities that the IAEA brings to all its activities should be sustained and enhanced.

• The Board of Governors should agree to provide an immediate one-time increase in the IAEA's budget by

€80 million for inter alia refurbishing the Safeguards Analytical Laboratory and for adequate funding of the Agency's Incident and Emergency Response Center(17). The Board should also agree to consistent annual increases in the regular budget to underpin the expansion of the Agency's security and safety work, other activities in support of new comer states embarking on nuclear programs, and an expansion of work in nuclear applications and technology transfer. The exact amount of additional regular budget should be determined after a detailed review of the budgetary situation and additional workloads of the Agency, but the Commission estimates that increases of about **€50 million** annually, in real terms might be necessary during several years.

• In the longer time frame, the regular budget will need to continue increasing in order to meet the growing demands for IAEA services. A substantially bigger regular budget – **by 2020 perhaps twice as large as the present one** – would allow the needed expansion of work on nuclear reactors and the fuel cycle, security and safety, and support for meeting basic human needs through nuclear applications and technical cooperation. It would also meet an additional funding requirement in the verification area to ensure an independent and credible system, and address other existing unfunded liabilities.

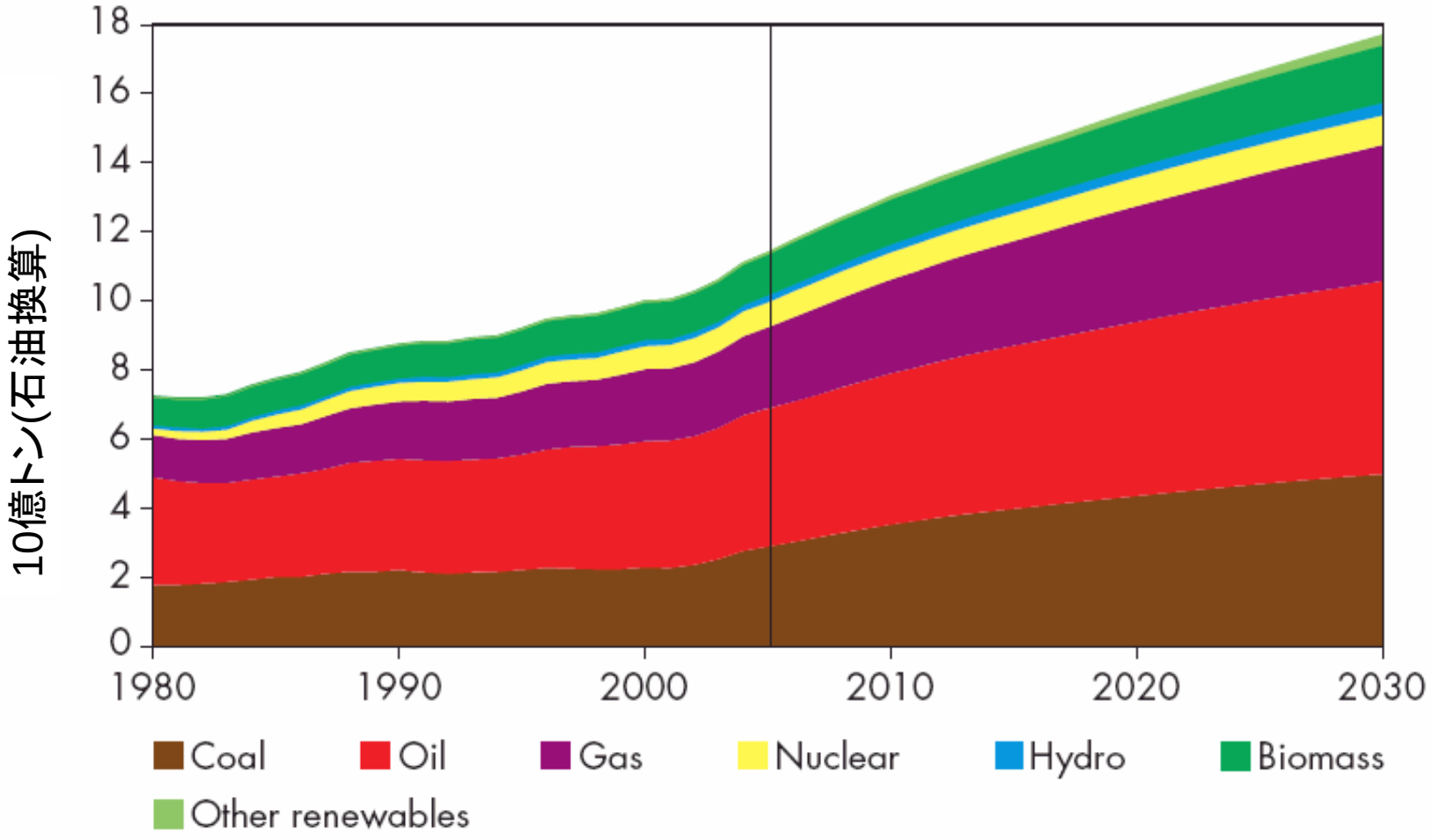
• To better inform planning and budget debates, the Agency should establish a comprehensive approach to assessing its future resource requirements, and should estimate the negative impacts and consequent risks of particular levels of budget constraint or gauge what could be done with particular levels of budget increases.

現在予算：€450M（700億円） 研究室更新費不足：€80M（120億円）

正規収入不足：€50M/年（80億円、2020年までには倍増が不可欠）

IAEA： 3S(Safeguard, Safety, Security)

一次エネルギーの需要



Source: International Energy Agency, *World Energy Outlook 2007,* reference scenario.

IPCC
Fourth Assessment Report
2007 November

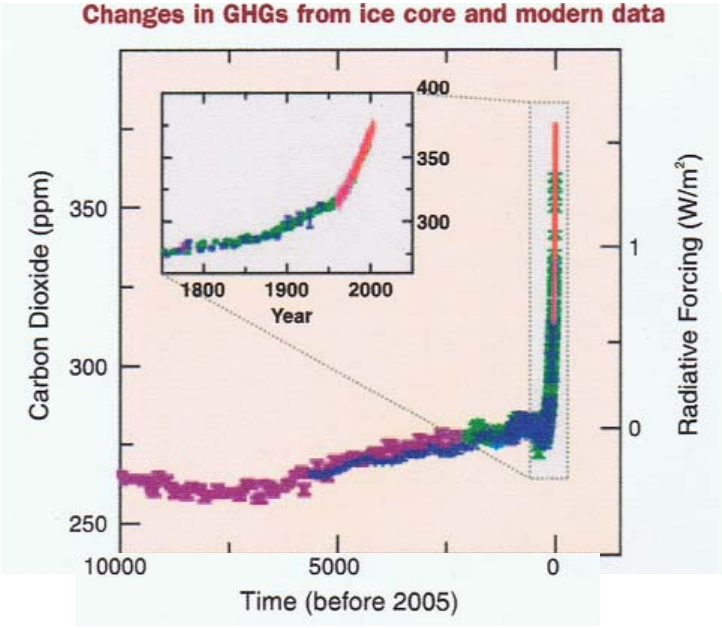
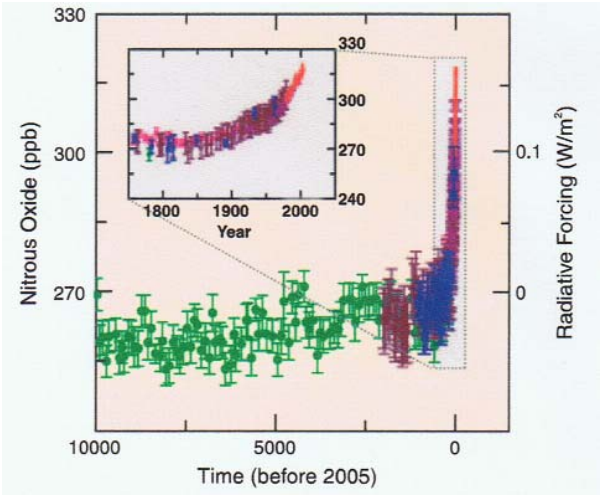
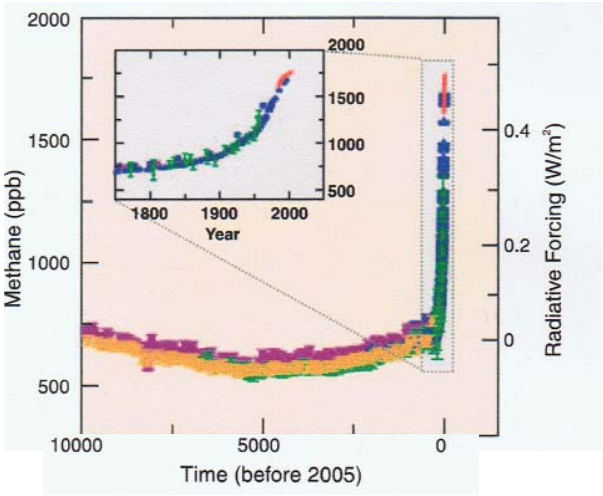


Figure 2.3. Atmospheric concentrations of CO_2, CH_4 and N_2O over the last 10,000 years (large panels) and since 1750 (inset panels). Measurements are shown from ice cores (symbols with different colours for different studies) and atmospheric samples (red lines). The corresponding radiative forcings relative to 1750 are shown on the right hand axes of the large panels. {WGI Figure SPM.1}





IPCC AR4 Synthesis Report, p38

Carbon Neutral Renewable Energy

Biomass energy	バイオマスエネルギー
Wind power	風力発電
Photovoltaic solar energy	太陽光発電
Solar thermal energy	太陽熱エネルギー
Hydroelectricity	水力発電
Geothermal energy	地熱エネルギー
Marine energy	海洋エネルギー

再生エネルギーの多様な環境リスク（現在）

エネルギー	指摘されたリスク
バイオマスエネルギー	食糧生産圧迫、土地肥沃化、水・農薬使用の影響 生物多様性への影響、景観の破壊
風力発電	騒音、美観損なう、鳥の生命、動く影、電磁気被害
太陽光発電	ライフサイクルアセスメントがすでに行われた。 不確実なのは材料供給。.
太陽熱エネルギー	技術開発が非常に遅れている。
水力発電	漁業への影響、生物多様性の圧迫、 住民の強制移住
地熱エネルギー	排出ガスについての不確実性
海洋エネルギー	鳥、魚のえさおよび繁殖への影響
省エネルギー	なし？

World Energy Assessment : Energy and the challenge of sustainability, 2000, UNDP

コストミニマムからリスクミニマムへ

長期的課題：エネルギー源の場合

エネルギー源	発電コスト*（2000年現在）	2050年までの環境リスク
石油	10 yen/kWH	枯渇及び地球温暖化
石炭	7	地球温暖化
バイオマスエネルギー	10	食糧生産との矛盾
風力	10	気候変化による効率低下
太陽光発電	70	気候変化による効率低下
水力発電	14	生物多様性への脅威
原子力発電	6	安全保障、安全性、廃棄物処理
省エネルギー	?	なし?

*概略値

エネルギー源の一つとしての原子力エネルギー

1） 原子力の立場での持続性問題の解釈と整理、およびその逆も。

2） 原子力を含む炭素中立な諸エネルギー源のリスク評価。

3） リスク比較による原子力エネルギーの相対的重要性評価

4） 原子力エネルギーの必要量の定量的予測

5） その必要量にもとづく客観的説得力を持つ原子力エネルギー政策論

6） IAEAの積極政策による原子力エネルギーのリスク低減