IGES Briefing Notes on the
Post-2012 Climate Regime

Issue
No . 8
February 2009

GHG Inventories

Koji FUKUDA and Simon EGGLESTON

KEY MESSAGES

- All Parties should routinely produce inventories. Enhanced opportunities for capacity development and information sharing at a regional level additional to the existing support scheme, exemplified by WGIA, is a step towards this goal.
- An external review process should be provided for in non-Annex I Parties. A progression from voluntary regional cross-checking to a regular external review for non-Annex I Parties should be considered over time.
- Both Annex I Parties and non-Annex I Parties should report the same gases. To do so, capacity building and technical cooperation for data provision and collection for HFCs, PFCs and SF_6 for non-Annex I Parties should be provided.
- The mandate and TOR of the Consultative Group of Experts should be revised with focus on a more substantive role for NATCOM of non-Annex I Parties.

Introduction: Many non-Annex I Parties have no routine emission inventory programmes and hence insufficient understanding of their emissions and removals of greenhouse gases. Good understanding may assist these countries participate in financial mechanisms under the United Nations Framework Convention on Climate Change (UNFCCC) by identifying mitigation opportunities and will aid their participation in the negotiations under the UNFCCC by providing a better understanding of how decisions made there will impact their country. Inventory knowledge and expertise can also help them deal with sustainable development and energy security issues by developing an understanding and statistics of the underlying drivers – such as energy consumption, transport demand, agriculture production and land use change.

In order to develop emission inventories in non-Annex I Parties there will need to be a programme of capacity development and support to establish inventory systems in these countries. While various issues remain around inventory programme schemes under the current climate regime, (such as institutional arrangements and ensuring full stakeholder participation) this Brief focuses on following issues that should be addressed to make the best use of capacity development and funding. Part of the materials and stakeholder perspectives presented are outcomes of IGES Consultations on Post-2012 Climate Regime, and drawn upon from the discussions at the Subsidiary Body for Implementations(SBI) of the UNFCCC.

**This brief reflects the views of participants at the IGES consultations on the post - 2012 climate regime.*

IGES
Institute for Global Environmental Strategies
URL:http://www.iges.or.jp

Key Issues

1. Implementation of routine inventories by all Parties
2. Extension of external reviews to non-Annex I Parties
3. Reporting all gases by all Parties
4. Mandate and the Terms of Reference of the Consultative Group of Experts for the future

Background: The UNFCCC National GHG Inventory is the standardized process of estimating and reporting anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol. The inventory result is used for evaluating the attainment of national targets for Annex I Parties, while also providing a common basis for climate negotiations for mid-term and long-term global and national GHG reduction targets.

As part of the obligations and commitments under Articles 4 and 12 of the UNFCCC, all Parties must develop their national inventories and report to the Conference of the Parties (COP) to the Convention through its Secretariat. Annex I Parties are obliged to develop a national inventory and report it to the Convention for evaluation using the National Inventory Report (NIR) and Common Reporting Format (CRF) tables. Meanwhile, non-Annex I Parties are required to report the status of GHG emissions and removals by submitting National Communications to the COP with a more flexible time schedule, and are not bound to submit NIR or CRF. As at February 2009, 134 non-Annex I Parties have submitted their first NATCOM, 9 their second and one their third.

Inventories submitted to the UNFCCC are based on the IPCC Guidelines. These Guidelines have evolved since the initial publication in 1991. Table 1 shows the current guidance and the differing requirements on Annex I and non-Annex I Parties under the UNFCCC.

Table 1. Use of IPCC Guidelines under the UNFCCC

Name of Guidelines	Status of Guidelines under UNFCCC	
IPCC Guidance	Annex I Parties	Non-Annex I Parties
Revised 1996 Guidelines (IPCC1996)	Use is mandatory by Annex I Parties	"Should" use
Good Practice Guidance, 2000 (GPG 2000)		Are "encouraged" to use as appropriate
Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG LULUCF) (IPCC2003)		
2006 Guidelines (IPCC2006)	Discussion on the use and timing of the implantation of these guidelines will start at SBSTA 30 in June 2009.	

Emission sources and removals by sinks to be reported within inventory are classified into 7 sectors; Energy, Industrial Processes, Solvent and Other Product Use, Agriculture, Land-Use Change and Forestry, Waste, as well as Other. Annex I Parties are required to report 6 GHGs: CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, while the requirement for non-Annex I Parties is limited to CO_2, CH_4, N_2O, and reporting other gases is "encouraged". It is also encouraged to report indirect GHGs such as NOx, NMVOC, CO and SO_2.

The IPCC Guidelines offer a default methodology with default emission and removal factors for use with national activity data, but all Parties are encouraged to develop their own country-specific factors and data, especially for significant sources and sinks, to make a more accurate description of GHG emissions and removals.

In supplementing the Revised 1996 Guidelines, the GPG 2000, provided guidance on Quality Assurance and Quality Control (QA/QC), Documentation and Reporting, selection of appropriate complexity of methods and quantitative evaluation of uncertainties. The GPG-LULUCF (2003) extended this to the Land Use, Land-Use Change and Forestry sector and developed the methods to complete coverage of all land types in contrast to the process related earlier guidance. The Emission Factor Database (EFDB) was developed and made available by the IPCC.

Reporting procedures for UNFCCC inventories by Annex I Parties should be in accordance with UNFCCC guidelines (FCCC/SBSTA/2006/9).

Table2. Submission Status of National Communications by Non-Annex I Parties (Asian Countries)

Non-Annex I Parties	Date of Submission		
	Initial National Communication	Second National Communication	Third National Communication
Afghanistan			
Bangladesh	12 November 2002	-	-
Bhutan	13 November 2000	-	-
Cambodia	8 October 2002		
China	10 December 2004	-	-
Democratic People's Republic of Korea	7 May 2004	-	-
India	22 June 2004	-	-
Indonesia	27 October 1999	-	-
Iran	31 March 2003		
Kazakhstan	5 November 1998		
Kyrgyzstan	31 March 2003		
Lao People's Democratic Republic	2 November 2000		
Malaysia	22 August 2000		
Maldives	5 November 2001		
Mongolia	1 November 2001		
Myanmar	-	-	-
Nepal	1 September 2004		
Pakistan	15 November 2003		
Philippines	19 May 2000		
Republic of Korea	12 February 1998	1 December 2003	-
Singapore	21 August 2000	-	-
Sri Lanka	6 November 2000		
Tajikistan	8 October 2002		
Thailand	13 November 2000	-	-
Timor-Leste			
Turkmenistan	8 November 2000		
Uzbekistan	22 October 1999		
Viet Nam	2 December 2003	-	-

Data compiled from the UNFCCC Homepage.

1. Implementation of routine inventories by all Parties

Issues: Currently, most non-Annex I Parties to the UNFCCC have no routine, regular inventory activity. Inventories are produced by on a "on-off" basis. (Table 2 summarizes the development status of the NATCOM by the Asian countries.)

While this is acceptable by the current UNFCCC requirements for the production of the National Communications it does lead to a number of problematic issues:

- No long-term development of inventory expertise. Many non-Annex I Parties bring together an expert group specialized for inventory development. Once the NATCOM is finished the skilled, experienced inventory developers disperse and there is no long-term benefit of the experience and knowledge accumulated or any capacity development. This knowledge and experience can contribute to other policy areas outside of climate change such as air pollution, sustainable development and energy security.
- No development of high quality data. While the presence of credible, official statistical data and activity data by categories are the crucial factors for developing high quality inventory development, such data are seldom well-developed in non-Annex I Parties. The underlying issues include weaknesses in the statistical system and a lack of experts. A routine inventory programme can help the development of reliable data that may be of use throughout government.
- Securing resources for inventories. While estimating and reporting procedures of inventory requires a considerable amount of time and resources, non-Annex I Parties are faced with other developmental needs, and budget allocations for inventories are unlikely to be a priority. In many cases it is difficult to secure sufficient resources to inventories, resulting in reliance on short-term external financial assistance.

Stakeholder Perspective: Differing perspectives are observed towards routine inventory development by all Parties. In support it is claimed that inventories should be submitted annually by all Parties to maintain consistency in data, enabling all Parties understand and analyze the trend of GHG emissions by categories, to maintain expertise and contribute to other policy issues. An opposing view is that the establishment of a comprehensive national statistical system should be prioritized.

In addition, some stakeholders argue that non-Annex I countries should be categorized into countries with similar emission patterns as a step towards routine inventories. However some claim that such a sub-grouping of non-Annex I countries is politically infeasible.

Table 3. Summary of Training Workshops Conducted by CGE and NCSP (Asia Region)

Training Workshop	Venue	Number Of Experts	Number Of Countries
National GHG inventories for the Asia region (CGE)	Shanghai, China 8-12 February 2005	26	19
Global Workshop on mitigation assessments (NCSP)	Seoul, Republic of Korea 26-30 September 2005	57	46
Vulnerability and adaptation assessments for the Asia and the Pacific region (CGE)	Jakarta, Indonesia 20-24 March 2006	64	39
NCSP follow-up training on LEAP system	Cairo, Egypt 3-7 April 2006	-	-

Source: FCCC/SBI/2006/25

Way Forward: Considering the significance of inventories in providing numerical basis for climate change negotiations, understanding and national targets, it is desirable for all Parties to routinely produce GHG inventories. Given the existing institutional, financial, and technical barriers for non-Annex I countries, the future climate regime should consider following options.

- Enhanced opportunities for capacity development and information sharing at regional level. In Asia region, various regional training workshops were provided by the Consultative Group of Experts (CGE) and other programmes such as National Communication Support Programme (NCSP) of UNDP/UNEP-GEF. The Table 3 summarizes those workshops. While those workshops contributed substantially to building capacities in preparing inventories for Asian countries, the workshops also identified the need for more opportunities for group interaction for information sharing and exercises to further strengthen their capacities. Thus, provision of additional opportunities for regional cooperation and capacity development may serve as an effective intermediate step toward achieving routine inventories by all Parties. The workshop on Greenhouse Gas Inventories in Asia(WGIA) initiated by Japan stands as an example of a regional capacity building workshop to complement UNFCCC workshops and fulfills such needs.

- Promoting awareness for inventories amongst policy makers in non-Annex I Parties. To secure budget allocation for inventory in non-Annex I Parties, it is crucial to raise awareness of policy makers on the wide value of inventory. Developing countries are encouraged to provide such opportunities for awareness of policy makers by, for instance, inviting them to the regional workshops and expert meetings on inventory.

The Workshop on Greenhouse Gas Inventories in Asia (WGIA): WGIA was initiated by the Japanese Ministry of the Environment and the National Institute for Environmental Studies in 2003, with its mandate to assist Asian countries in improving inventories by providing opportunities to exchange information in the region. The WGIA has been recognized as part of the Kobe Initiative launched at the G8 Environment Ministers Meeting in Kobe, Japan, in May 2008. So far the WGIA involves 14 Asian countries as well as relevant organizations such as UNFCCC Secretariat and Technical Support Unit of IPCC Task Force on Inventories, and has built a regional network for information sharing on the details of the inventory such as the process of developing country-specific emission factors and activity data collection, as well as holding regional expert group meetings. (Source: Umemiya 2006 and proceedings of WGIA meetings)

2. Extension of external reviews to non-Annex I Parties

Issues: External review of inventories is an essential process for improving the overall quality of the inventory as well as increasing credibility of emission and activity data submitted to the Convention. Under the current climate regime, Annex I Parties (AIP) are mandated to produce annual GHG inventories and national communications for every 3 to 5 years. Both the annual GHG inventories and National Communications of AIP are subject to "in-depth" review by the Expert Review Team (ERT) coordinated by the UNFCCC Secretariat.

Procedures of Review Process for Annual GHG Inventories submitted by Annex I Parties: Typically, the reviews of annual GHG inventories submitted by Annex I Parties are conducted as a centralized review, where 5-8 inventories are reviewed by an ERT convened at the secretariat; a desk review, where 3-5 inventories are reviewed by experts based in their home countries; or an in-country review, where a single inventory is reviewed by an ERT in the Party under review. The members of the ERT are selected from the roster of nominated experts from both the Annex I Parties and the non-Annex I Parties. In-country review teams generally require 6 experts whereas centralized review takes up to 12 experts, and it is estimated that 120 experts are required per annum for conducting external review for Annex I Parties. For inventories submitted under the Kyoto Protocol, if any problems are found, ERT may produce a recommendation for an adjustment of data. Disagreement between the host country and ERT will be acted upon by the Compliance Committee. Upon finalization of the compliance procedure, the GHG data are compiled and displayed in the data base. (Source: UNFCCC Homepage)

On the other hand, the required contents of the national communications (NATCOM) and the timetable for the non-Annex I Parties are more flexible as compared to the requirements for the AIP. At moment, NATCOM of the non-Annex I Parties are not subject to the external review.

Thus inventories of non-Annex I Parties are not subject to formal review under the Convention. In order to improve the quality of the inventories, and to increase the capacity of inventory compilers in non-Annex I Parties, external review of their inventories is desirable, without needing the formal nature of the UNFCCC process. As part of the technical advice and technical assistance provided by numerous multilateral and bilateral agencies, the modality of external review for the non-Annex I Parties may be elaborated.

In the meantime, the extension of external reviews to the non-Annex I Parties raises a capacity issue. The current ERT scheme struggles to get sufficient expert reviewers and funding for them. If non-Annex I Parties wish to get the benefit of the best inventory expertise then securing sufficient budget and increasing capacity for review are essential.

Stakeholder Perspective: Considerable opposition to such reviews has been expressed by non-Annex I Parties. In the IGES Consultations, various stakeholders claimed that due to the existing gap in the quality and depth of inventories between Annex I Parties and non-Annex I Parties, providing systematic support to assist non-Annex I Parties to develop comparable quality of NIR should be achieved first before applying external reviews. There are also some political concerns as review may be seen as part of the commitments of non-Annex I Parties in the current negotiations of MRVs under the UNFCCC. However, other stakeholders suggested the establishment of voluntary cross-check system among neighboring countries as a less demanding form of external review.

Way Forward: As expressed by stakeholders in the IGES Consultations, it is not realistic to apply the same rigour of external reviews to non-Annex I Parties as in Annex I Parties. To reconcile this with the technical improvements the review would bring, it is suggested for the future climate regime to develop a step-wise approach for implementing external reviews to non-Annex I Parties. As a first step, it may be better to initiate external reviews by establishing a voluntary cross-checking system on a regional level. This process should be supported by Annex I Parties through provision of capacity building of reviewers as well as establishing standards for monitoring of cross-checking activities among non-Annex I Parties. Annex I Party experts could also be involved, sharing their knowledge and expertise. It should be made very clear this is not the same as the existing Annex I review process. Only after non-Annex I Parties build capacity and increase their confidence in their inventories, external review system could be

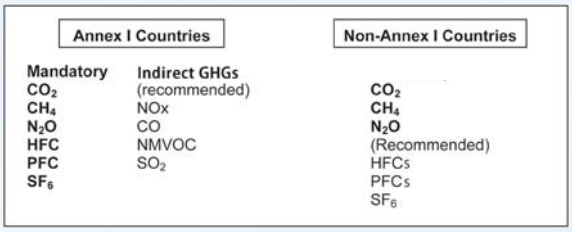

Diagram 1: Coverage of GHG in Inventories for Annex I and non-Annex I Countries

gradually upgraded to a mandatory scheme of the Convention. To prepare for inclusion of non-Annex I Parties in existing external review scheme, the future climate regime should also reinforce the review system by increasing the number of experts for ERT and securing additional budget to cover the review activities for non-Annex I Parties by the ERT.

3. Reporting 6 GHGs by All Parties

Issues: Should Annex I and non-Annex I Parties report the same list of gases? As depicted in the diagram, Annex I Parties are required to report 6 GHGs; CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, and are encouraged to include indirect GHGs; NOx, CO, NMVOC, SO_2, while the requirement of non-Annex I Parties are limited to CO_2, CH_4, and N_2O. In addition, currently the UNFCCC is considering adding to this list additional direct greenhouse gases for any second commitment period.

Stakeholder Perspective: Again, opposing views exist among stakeholders regarding the coverage of GHGs. Some stakeholders claim that it is not necessary for non-Annex I Parties to include HFCs, PFCs and SF_6 in their inventories to move the climate regime forward, as their emissions are trivial compared to the total global emissions. Others claim that all Parties should report 6 GHGs, as differentiation of target gases in inventories between Annex I Parties and non-Annex I Parties lacks balance and cannot be justified toward stabilisation of atmospheric concentration of GHGs. Unification of target gases by all Parties is also supported by notions of solidarity amongst non-Annex I countries: excluding Parties with small amount of GHG emissions from inventory may not be a politically gesture, as in most cases they are the most vulnerable to climate change.

Way Forward: For the future climate regime, the negotiations should reach a consensus that all Parties should report the same gases. To assist reaching such a consensus, Annex I Parties should provide international data on the production and trade in the fluorinated gasses. For non-Annex I Parties much of such information is available in trade documentation or reports under the Montreal Protocol.

4. Mandate and Terms of Reference of the Consultative Group of Experts for the Future

Issues: Another critical issue surrounding the GHG inventories is the function of the CGE. The CGE was established by Decision 8/CP.5 with the purpose of improving the process of preparation of National Communications by non-Annex I Parties, and its mandate and terms of reference were also included in the Annex to the Decision. Since the extension of its mandate by Decision 3/CP.8 and adoption of the 5-year work programme (2003-2007), the CGE has played a key role in providing technical advice by means of generating reports as well as technical assistance through regional hands-on training

Table 4. Summary of the CGE Meetings During the Work Programme 2003-2007

Meeting	Venue	
1st Meeting	23-24 September 2003	Mexico City, Mexico
2nd Meeting	3-4 May 2004	Manila, Philippines
3rd Meeting	2-3 December 2004	Buenos Aires, Argentina
4th Meeting	14-15 April 2005	Maputo, Mozambique
5th Meeting	24-25 November 2005	Montreal, Canada
6th Meeting	17-18 March 2006	Jakarta, Indonesia
7th Meeting	25-26 September 2006	Pretoria, South Africa
8th Meeting	1-3 March 2007	Belize City, Belize
9th Meeting	24-25 September 2007	Cairo, Egypt

Data compiled from the SBI

workshops to the non-Annex I Parties. Table 4 summarizes the meetings of the CGE during the work programme 2003-2007.

In order to consider the activities of CGE beyond 2007, SBI collected 14 submissions from the Parties on the mandate and TOR of the CGE for consideration at SBI27. While this review process was supposedly completed by SBI27, the SBI was unable to reach its conclusion at SBI27 due to conflicting views by the Parties on, among others, the role and function of the CGE. The discussion was not settled at the following SBI28 and SBI29, and will be resumed at SBI30. The extended discussion has inevitably halted activities of the CGE since the end of 2007 until now.

Stakeholder Perspective: While all Parties recognized and appreciated the past work of the CGE in preparation of NATCOM for non-Annex I Parties, divergent views are observed with regard to its future mandate and TOR. Many non-Annex I Parties view the current mandate and TOR of the CGE as sufficient, and demand status quo conditions for activities. For instance, China considers the current mandate and TOR provided in Decision 3/CP.8 as sufficient, and supports continuation of the current mandate and TOR. Similarly, Uzbekistan believes that as the CGE makes a "worthy contribution in successful implementation of the UNFCCC", the current mandate and TOR are "being well fulfilled" (SBI 2007).

On the contrary, some Annex I Parties feel the necessity of revising the current mandate and TOR. Australia views that as the needs of non-Annex I Parties change with the increased experience and expertise for preparation of NATCOM, so should the role of the CGE. In this regard, Australia supports shifting the emphasis of the CGE toward regular, individual examination of NATCOM of non-Annex I Parties with provision of technical support for non-Annex I Parties for achieving regularization and institutionalization of the reporting process. The US supports reinforcing the reporting requirement of non-Annex I Parties with submission of GHG inventories in every 2 years and NATCOM in every 4 years with exemption of the least developing countries considering the significance of GHG emissions from the non-Annex I Parties and the substantial improvement in their capacities for producing NATCOM. In addition, the US proposes the examination of individual national communications by experts accredited by the UNFCCC.

Way Forward: A total of 8 years of technical assistance[1] by the CGE has indeed contributed to a substantial improvement in the reporting capacity of non-Annex I Parties and that changing the mandate and TOR with the emphasis on a more substantive role seem to be in a right direction to move forward, while noting that setting a reporting requirement with fixed periodicity for non-Annex I Parties national communications may exceed capacities of some non-Annex I Parties.

While completion of 2nd and 3rd NATCOM by many of non-Annex I Parties in the near future is anticipated, it is crucial for all Parties to recognise the re-commencement of the CGE as the first and foremost priority, and strive collectively to reach its conclusion.

Conclusion

While the current climate regime has a different reporting system, frequency, and target GHGs of inventory for Annex I Parties and non-Annex I Parties, the wide values and positive implications of inventories toward policy developments should be recognized by all Parties. Particularly, it is crucial for policy makers of non-Annex I Parties to realize that prioritizing and investing in inventories is a key step toward achieving sustainable development. As inventory should be a continuous process in which experience and know-how on GHG emissions and removals and the underlying statistics accumulate over time, non-Annex I Parties have opportunities to use this know-how in areas such as CDM project development, quantitative analysis of co-benefits, and formulating energy security policy.

In the long run, all Parties should be integrated into a common inventory system by reconciling the current barriers. To do so, Annex I Parties will need to support non-Annex I Parties by providing technical and financial assistance, by recommencement of the CGE as well as by taking the initiative in providing supplementary technical workshops to further reinforce regional interaction and mutual cooperation for inventory development. Non-Annex I Parties will need to institutionalize inventory development into a regular process which will create a virtuous cycle of improving quality and credibility, enhancing ownership, and applying know-how of inventories for policy formulation toward sustainable sustainable development in non-Annex I Parties.

References

Umemiya, C. 2006. *Greenhouse Gas Inventory Development in Asia: Experiences from Workshops on Greenhouse Gas Inventories in Asia*. Tsukuba, Japan: National Institute for Environmental Studies.

IPCC (Intergovernmental Panel on Climate Change). 1997. ***Revised 1996 PICC Guidelines for National Greenhouse Inventories***, edited by J.T. Houghton, L.G. Meira Filho, B. Lim, K. Treanton, I. Mamaty, Y. Bonduki, D.J. Griggs and B.A. Callender. Paris: IPCC/OECD/IEA.

IGES (Institute for Global Environmental Strategies). 2000. ***Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories***, edited by J. Penman, D. Kruger, I. Galbally, T. Hiraishi, B. Nyenzi, S. Emmanuel. L. Buendia, R. Hoppaus, T. Martinsen, J. Meijer, K. Miwa and K. Tanabe. Hayama, Japan: IPCC/OECD/IEA/IGES.

IGES (Institute for Global Environmental Strategies). 2000. ***Good practice guidance for land use, land-use change and forestry***, edited by J. Penman, M. Gytarsky, T. Hiraishi, T. Krug, D. Kruger, R. Pipatti, L. Buendia, K. Miwa, T. Ngara, K. Tanabe and F. Wagner. Hayama, Japan: IPCC/IGES.

IGES (Institute for Global Environmental Strategies). 2006. ***2006 IPCC guidelines for national greenhouse gas inventories***, edited by S. Eggelston, L. Buendia, K. Miwa, T. Ngara, K. Tanabe. Hayama, Japan: IPCC/IGES.

UNFCCC (United Nations Framework Convention on Climate Change). 2007. SBI 27th Session. *Views on the mandate and terms of reference of the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention. Submission from Parties*. UNFCCC. FCCC/SBI/2007/MISC.7. 2007.

[1] **Aggregate of work programme 1999-2002 and work programme 2003-2007**

Acknowledgements: We acknowledge that the financial support from Global Environmental Research Fund (H-O64) of Ministry of Environment, Japan; reviewers Prof. H. Hamanaka, Mr.H.Mori, Mr.T.Hiraishi, Mr. N. Srivastava and Mr. K. Tanabe.

Suggested citation: Koji Fukuda*. 2008. Investment and Financial Flows for the Future Climate Regime. IGES Briefing Notes on the Post-2012 Climate Regime. Issue No. 8. Institute for Global Environmental Strategies, Hayama, Japan. pp 1-8.

*e-mail: fukuda@iges.or.jp

CONTACT

IGES

Institute for Global Environmental Strategies
2108-11 Kamiyamaguchi, Hayama, Kanagawa, Japan 240-0115
TEL: 81-46-855-3700 FAX: 81-46-855-3809
URL:http://www.iges.or.jp