JOINT STATEMENT OF THE 23rd MEETING OF THE WORLD SEMICONDUCTOR COUNCIL (WSC)

Xiamen, China

MAY 23rd, 2019

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I. Introduction

The world's leading semiconductor industry associations – consisting of the Semiconductor Industry Associations in China, Chinese Taipei, Europe, Japan, Korea, and the United States – held the 23rd meeting of the World Semiconductor Council (WSC) today in Xiamen, China.

The meeting was chaired by Mr. Zhao, Haijun of Semiconductor Manufacturing International Corporation, and chair of the host delegation, the Semiconductor Industry Association in China, Mr. Wei, Shaojun. The other delegations attending the 23rd WSC meeting – Semiconductor Industry Associations in Chinese Taipei, Europe, Japan Korea, and US – are chaired, respectively, by Mr. Mark Liu of Taiwan Semiconductor Manufacturing Company, Mr. Jens Knut Fabrowsky of Robert Bosch GmbH, Mr. Yasuhiro UEDA of Sony Corporation, Mr. Chang Han KIM of Samsung Electronics, and Mr. Keith Jackson of ON Semiconductor.

The WSC meets annually to bring together industry leaders to address issues of global concern to the semiconductor industry. The WSC's mandate is to encourage cooperation to promote fair competition, open trade, protection of intellectual property, technological advancement, investment liberalization, market development, and sound environmental, health and safety practices. The WSC also supports expanding the global market for information technology products and services.

Established under the "Agreement Establishing a New World Semiconductor Council" signed on June 10, 1999, and amended on May 19, 2005, the WSC has the goal of promoting cooperative global semiconductor industry activities in order to facilitate the healthy growth of the industry from a long-term global perspective. This Agreement states, "the increasing globalisation of the semiconductor industry raises important issues that must be addressed effectively through international cooperation within the world semiconductor industry", and that "the WSC activities . . . shall be guided by principle of fairness, respect for market principles, and consistency with WTO rules and with the laws of the respective countries or regions of each Member. The WSC recognizes that it is important to ensure that markets will be open without discrimination. The competitiveness of

companies and their products should be the principal determinant of industrial success and international trade."

The WSC seeks policies and regulatory frameworks that fuel innovation, propel business, and drive international competition and avoid any actions that distort markets and disrupt trade. Antitrust counsel was present throughout the meeting. During the meeting, the below reports were given and discussed, and related actions were approved.

II. Cooperative Approaches in Protecting the Global Environment

The WSC is firmly committed to sound and positive environmental policies and practices. The members of the WSC are proactively working together to make further progress in this area.

(1) PFC (Perfluorocompound) Emissions

The global semiconductor industry is a very minor contributor to overall emissions of greenhouse gases, and the industry is continuously working to further reduce our contribution to emissions of GHGs. One important part of our GHG emission reduction efforts is our voluntary reduction of PFC gas emissions. In 1999, the WSC (consisting at that time of each of the original regional semiconductor associations in the U.S., the European Union, Japan, Korea, and Chinese Taipei) agreed to reduce PFC emissions by at least 10% below individual baselines for each regional semiconductor association by the end of 2010. The WSC has previously announced that, the industry had far surpassed this goal. Over the 10-year period, the WSC has achieved a 32% reduction. In 2011, the WSC (consisting of the five regional semiconductor associations in the 1999 agreement, with the addition of SIA in China) also announced a new voluntary PFC agreement for the next 10 years. The elements of the 2020 goal include the followings:

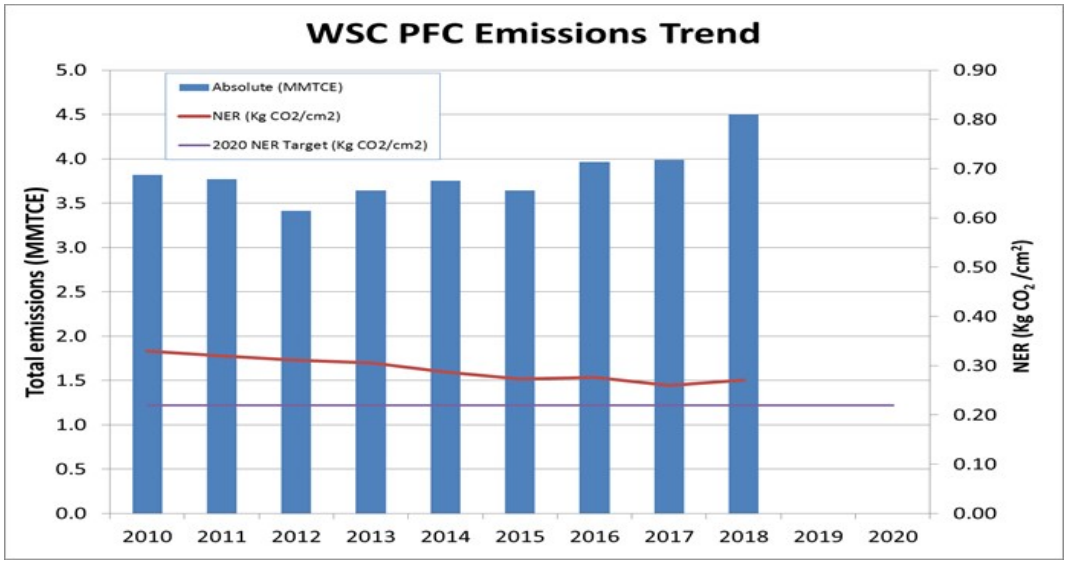
- The implementation of best practices for new semiconductor fabs. The industry expects that the implementation of best practices will result in a Normalized Emission Rate (NER) in 2020 of 0.22 $KgCO2e/cm^2$ equivalent to a 30% NER reduction from 2010 aggregated baseline. Best practices will be continuously reviewed and updated by the WSC.

- The addition of "Rest of World" fabs (fabs located outside the WSC regions that are operated by a company from a WSC association) in reporting of emissions and the implementation of best practices for new fabs.
- A NER based measurement in kilograms of carbon equivalents per area of silicon wafers processed (KgCO2e/cm^2) that will be a single WSC goal at the global level.

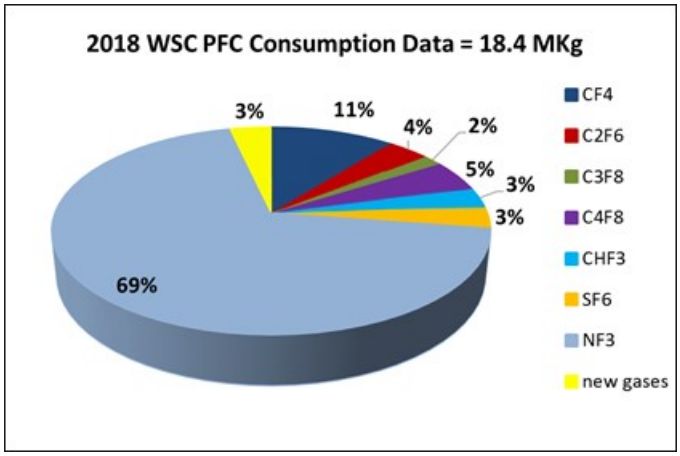
The WSC agreed to report its progress on this new voluntary agreement on an annual basis. This external reporting will provide aggregated results of the absolute PFC consumption and emissions alongside each other and NER trends. These figures represent combined emissions for the six WSC regional associations, in their own regions and in the "Rest of World" fabs described above. In addition, to improve transparency, the WSC has made its Best Practices for PFC Reduction document available previously on the WSC website. In 2017 the WSC has also revised its best practices document and published this update on the WSC website. The 2016 reporting also includes the reporting of newly used gases CH_2F_2, C_4F_6, C_5F_8 and C_4F_8O. In addition, the WSC reports the individual gas breakdowns.

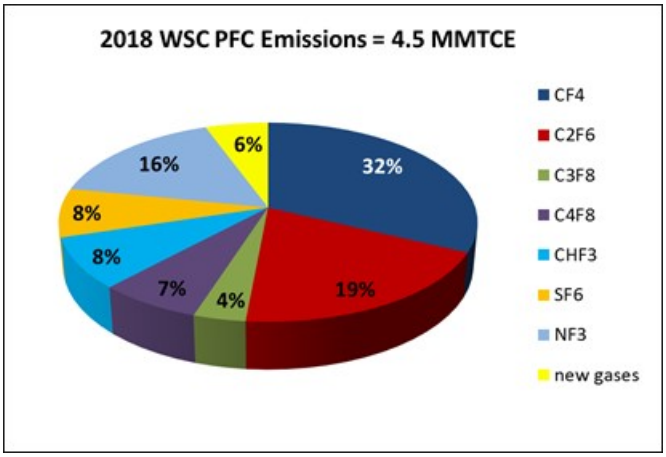
The eight-year results are as follows: in 2018, combined WSC absolute emissions of PFCs increased by 18% above 2010 to 4.50 MMTCE in 2018. The NER decreased by 18% compared to 2010 and increased 4.2% above 2017. Please see the graph below, which compares these results to 0.22Kg/cm^2 equivalent and to a 30% NER reduction anticipated by 2020.

Results of WSC PFC Emission Trends



2018 WSC PFC Consumption and Emissions Data





The WSC is encouraged by the overall trends in reducing normalized PFC emissions in the semiconductor industry. We note, however, that achieving these reductions is becoming increasingly challenging due to a number of factors. These factors include: increased manufacturing process complexity, which sometimes requires the use of additional and different gases; the addition of new gases (e.g., CH2F2, C4F6, C5F8 and C4F8O), which represents in 2018 about 5.6% of WSC emissions; and different measurement and reporting methods, such as the updated reporting regulations in the U.S.

In order to ensure the continued accuracy of WSC reporting on PFC emissions, the WSC notes that it has continued to work at the expert level with the Intergovernmental Panel on Climate Change (IPCC) on their process to refine the guidelines applicable to the reporting of emissions.

(2) Chemical Management

The WSC remains concerned about potential chemical regulatory approaches that may have a disproportionate impact on semiconductor manufacturing. **The WSC recommends that Governments/Authorities proceed carefully in regulating chemicals that are essential to the semiconductor industry. The WSC recommends that Governments/Authorities take into account the limited potential risk of exposure from uses in the semiconductor industry and the chemical management practices in the semiconductor industry. The WSC recommends that any regulations provide the semiconductor industry with sufficient time to evaluate our uses of chemicals and the uses within our supply chain. If restrictions on chemicals used in our industry are deemed to be necessary and appropriate for the protection of human health and the environment, the WSC recommends that Governments/Authorities provide sufficient time for the industry to identify, qualify, and transition to alternative chemicals that satisfy our functional and performance requirements, and be provided with exemptions to allow continuation of critical uses of these chemicals in processes and articles.**

(3) Resource Conservation

Semiconductor devices contribute to improved resource conservation in our world. Energy efficiency enabling semiconductors play a key role in the more efficient transmission, distribution and consumption of energy which also largely contributes to world's carbon emission reduction, contributing to humankind's achieving the United Nation's carbon reduction goal under the global climate change risk mitigation.

Traditional forms of energy and renewable energy sources will not be sufficient alone to meet the world's future energy needs. Consuming energy more efficiently is therefore of paramount importance, and semiconductor devices help

achieve this goal. Semiconductor devices enable a more efficient use of energy in all aspects of our daily lives: in the home, office or on the road; in industrial manufacturing; in public infrastructure; and in public transport. The semiconductor sector itself is not a large natural resource consumer amongst global industries. However, the WSC's members continue to focus activity on reducing the use of resources involved in the device manufacturing processes to reduce the direct impacts to the local and global environment. The semiconductor sector will continue to pursue environmental conservation programs in its fabs in the areas of energy, water and waste and the industry will continue to share examples of improvement practices.

(4) Safety and Health

The WSC is focused on a sound proactive approach to safety and health (S&H) policies and practices, including the provision of a workplace environment that is safe and healthy for all employees.

At the WSC level, four associations have collected S&H aggregated data for the years 2013-2018. The aggregated work-related injury rate during this period has typically been in the range of 0.5 injuries per 100 full time employees (FTE) annually. The days away from work rate has typically been in the range of 4 days per 100 full time employees (FTE) annually in this 6-year period. The data remains stable over the period of collection. The remaining associations are exploring the possibility to collect S&H data. Additionally, the WSC is also looking at opportunities to share S&H semiconductor best practices in expert settings, to advance industry practices as a whole.

III. Responsible Minerals Sourcing

In 2018, the WSC updated its original Conflict-Free Supply Chain Policy of 2013 and underlined that the global semiconductor industry is committed to using 'responsibly sourced' minerals in their semiconductor products. This update also reflected the evolving status of the topic and referenced the deep concerns about the sources of minerals from 'conflict-affected and high-risk areas' (CAHRA) which

goes beyond the original focus of the policy statement on the 'Democratic Republic of the Congo (DRC) and surrounding countries'[1]. This update emphasized the importance of supply chains acting responsibly to source minerals and agreed that the WSC will promote the 'OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas'[2] among its members to do this. The OECD guidance serves as a common reference for all stakeholders in the mineral supply chain in order to clarify expectations concerning the nature of responsible supply chain management of minerals from conflict-affected and high-risk areas.

The global semiconductor industry is a recognized leader in addressing the issues related to the sourcing of minerals. The semiconductor industry has been involved in the development of compliance tools (such as the OECD due diligence guidance framework) that have been readily adopted by other key industry sectors and has implemented state of the art programs to track progress.

The WSC has undertaken another industry survey for year 2018 with its members to ascertain the state of progress of implementation of this responsible minerals sourcing policy across the industry. The 2018 survey indicates that the industry's activities continue and are now beginning efforts to move beyond the original DRC and surrounding countries and the 3TG scope, with customers starting to ask questions on non-3TG minerals. The survey identifies that all company respondents have established a minerals policy and have publicly published their policy and have received questions from their customers on the sourcing of the minerals used in their products. The survey also identifies that the industry sees reaching out to smelters/refiners to become compliant (certified) and phasing out non-compliant smelters/refiners in the supply chain as amongst the biggest current

[1] "surrounding countries" as defined under the Dodd-Frank Wall Street Reform Act 2012 (Central Africa Republic, South Sudan, Zambia, Angola, The Republic of the Congo, Tanzania, Burundi, Rwanda, Uganda)

[2] Conflict-Affected and High-Risk Areas' as outlined in the OECD (2016), OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Third Edition.

challenges.

The WSC recognizes the Responsible Minerals Initiative's (RMI)'s Responsible Mineral Assurance Process (RMAP) or programs cross recognized by RMI as a best practice for assuring responsible mineral sourcing in the supply chain. The WSC also welcomes the certification of more global smelters and refiners through the Responsible Minerals Initiative Assurance Process as a positive development.

The WSC would recommend that if GAMS members are considering new responsible minerals sourcing type of legislation, that the legislation should be globally aligned to ensure that such legislations promote the harmonization of global efforts for creating responsible supply chain management of minerals from conflict-affected and high-risk areas and should utilize existing compliance tools (such as the OECD due diligence guidance framework) and initiatives (such as (Responsible Minerals Initiative) and be based on voluntary principles.

IV. Fighting the Proliferation of Semiconductor Counterfeiting

The WSC remains committed to intensify anti-counterfeiting work activities through its Anti-Counterfeiting Task Force. The failure to respect intellectual property rights (IPRs) threatens the creativity and innovation which underpin prosperous societies and industry sectors like semiconductor manufacturing. The collision of the online economy and globalization has created a perfect environment for counterfeiters, allowing them to sell counterfeit goods directly worldwide with virtually no barriers to entry, low cost of set up and fewer risks of being caught. The WSC supports pro-active online enforcement activities to remove trademark infringing and counterfeit semiconductors from online platforms.

The WSC has shared examples of anti-counterfeiting capacity building measures that could be employed across the semiconductor industry and has circulated widely the WSC's updated White Paper "Winning the Battle against Counterfeit Semiconductor Products" that describes the risks from counterfeit

products and the industry best practices that should be employed. Semiconductors are the "brains" inside critically-important electronic systems, including healthcare and medical equipment, electric power grids, communications systems, automotive braking and airbag systems, and aviation systems.

Because they control the performance of these and other vital electronics, the proliferation of counterfeit semiconductor products creates serious risks to the safety and health of the public and to critical national infrastructure and can have a significant economic impact for semiconductor rights holders.

WSC members remain committed to increasing awareness of the infrastructure, public health and safety risks caused by counterfeits at international public conferences. As part of this awareness-raising, the WSC announces its support the Global Anti-Counterfeiting Group's (GACG) World Anti-Counterfeiting Day on June 6, 2019 which aims to increase the awareness of the problems and risks caused by the proliferation of counterfeits.

The WSC appreciates the GAMS' statement at its 2018 meeting, underlining the GAMS' commitment to fighting semiconductor counterfeiting. The WSC looks forward to continued coordination with GAMS in stopping counterfeits and will continue to cooperate with GAMS customs and enforcement authorities across all regions of the WSC in these efforts.

The WSC recommends that GAMS members continue to implement appropriate domestic, bilateral and multilateral IP enforcement countermeasures to deal with counterfeit semiconductors. The WSC supports GAMS coordination with their customs and law enforcement authorities to facilitate a further strengthening of IP enforcement activities at regional and national levels in cooperation with industry.

V. Effective Protection of Intellectual Property

Intellectual property (IP) is the lifeblood of the global semiconductor industry, and respecting and enforcing intellectual property rights is essential to the industry's global competitiveness. The global semiconductor industry invests over 10% of revenue into R&D, one of the highest proportions of any industry. The

trend worldwide in the last decade, and in most WSC member countries, is for significant growth in patent applications and patent grants. Therefore, protection of the IP that results from this R&D (i.e. patents, trade secrets, source code, etc.) is essential to the industry's competitive position, and to preserving incentives for innovation. **The WSC encourages the GAMS to ensure that intellectual property is strongly protected and enforced in their domestic laws and regulations**.

A. Patent Quality

One important precondition for effective protection of intellectual property is a system that ensures the granting of high-quality patents. The WSC continues to work to improve patent quality, including continuing cooperation with WIPO and the patent offices of GAMS members. The WSC commends WIPO for its efforts to collect and publish meaningful metrics bearing on patent quality across jurisdictions and encourages WIPO to continue and expand this effort. **The WSC appreciates the GAMS's recent reiteration of support for the WSC's efforts to improve patent quality**.

B. Abusive Patent Litigation (NPEs/PAEs)

The WSC recognizes that abusive patent litigation seriously undermines innovation by redirecting research expenditures and other resources to unnecessary litigation expenses, and by making it more difficult to bring products to market. The WSC supports the continued focus on preventing abusive patent litigation.

In view of this, the WSC encourages a range of "best practices" in regard to the issue of abusive patent litigation, including NPEs/PAEs. As a result, the WSC adopted a set of "Abusive Patent Litigation (Including NPEs/PAEs): Best Practices to Combat Abusive Patent Litigation" as set forth in Annex 1 to the WSC's 2017 Joint Statement. The WSC will continue to evaluate regional policies compared with the Best Practices.

The WSC encourages GAMS to support these Best Practices in addressing abusive patent litigation practices.

In this connection, the WSC notes that an important challenge in patent litigation analysis is the availability of data across jurisdictions. In its 2018 IP Indicators report, WIPO found that many jurisdictions lack systematic data on patent litigation, and that enhancing data availability of patent litigation systems would be helpful to effective policymaking and analysis. **The WSC encourages the GAMS to cooperate with WIPO to implement meaningful and consistent public access to patent litigation data in key jurisdictions**.

C. Trade Secrets

The WSC continues to discuss how to better protect trade secrets in the industry. Given the rapid speed of innovation in the semiconductor industry, trade secret theft can cause a company to lose its competitive advantage and market share. Trade secret theft also impedes continued semiconductor research and development by reducing the incentive for companies to invest in building the next generation of semiconductors.

Trade secret theft is extremely difficult to protect against. Many cases in the semiconductor industry involve an employee leaving a company and taking trade secrets with them upon their departure. This theft is even more difficult to protect against when competitors are willing to offer high, non-market rates to employees.

The rapid growth of the internet has resulted in companies facing greater threats of trade secret theft from sophisticated actors, especially through cyber means. The threat to semiconductor companies is magnified given the critical role of semiconductors in emerging technologies, such as artificial intelligence and the internet of things. **The WSC urges GAMS to adopt strong trade secret protections in trade agreements and domestic laws. The WSC reiterates its encouragement, first stated in the 2015 WSC Joint Statement, for GAMS to support the WSC "Core Elements for Trade Secret Protection Legislation."**

The protection of trade secrets can be facilitated, in addition to appropriate legislative measures and enforcement, by the establishment of Corporate Compliance and Ethics programs (CEPs) by companies to discourage their employees from illegally taking others' trade secrets. A number of companies have adopted Codes of Business Conduct that require their employees to respect the intellectual property, including trade secrets, of other companies – including

competitors. Many companies have also established internal Compliance and Ethics Programs (CEPs) to create an organizational culture of compliance with laws and ethics within the company. These programs include procedures to prevent and detect criminal conduct, explicit policies such as protection of trade secrets in a Code of Business Conduct, and mechanisms for employees to report suspected wrongdoing to the CEP. Building on its past recommendations to enhance the protection of trade secrets, the WSC recommends that GAMS utilize laws, policy directives, trade agreements, and other means to encourage companies to implement Compliance and Ethics Programs that protect trade secrets.

VI. Customs and Tariffs

A. Implementation, Geographic Expansion, and Review of the Information Technology Agreement (ITA) and ITA expansion

The WSC highlights the significance of the 2015 ITA expansion in establishing a global tariff-free environment for a wide range of semiconductor products, including advanced devices such as Multi-component Integrated Circuits (MCO) and Multi-chip Integrated Circuits (MCP). The ITA expansion has facilitated the free flow of these advanced products, which like other semiconductors, are the foundational enabling technology for virtually all ICT goods.

With regard to new import tariffs imposed by one country on certain MCOs with the 2017 update of the World Customs Organization (WCO) Harmonised System (HS), the WSC supports the GAMS conclusion at the 2017 Busan meeting that duties should not increase as a result of changes to the HS.

The WSC observes that the WTO procedures for the transposition of goods' schedules into HS2017 make clear that the scope of concessions shall remain unchanged, and if changes are necessary, these changes should be transparent, in line with WTO rules and clearly flagged. Also, the methodology chosen for any change should have been clearly explained and the draft HS2017 files should have been approved in the WTO.

The WSC regrets the lack of transparency as well of the necessary clarifications – as underlined by the WTO Secretariat in their letter to GAMS -

from the relevant Member regarding the application of multiple duty rates to different MCOs.

The WSC recalls that in the Ministerial Declaration on ITA Expansion (July 28, 2015), parties "encourage autonomous immediate elimination of customs duties or accelerated implementation prior to the [normal staging] dates…, for instance for products with relatively low customs duties."

Based on the Busan understanding on tariffs on products upon changes to the HS, on the encouragement in the 2015 ITA Ministerial Declaration for parties to autonomously eliminate customs duties on products with low tariffs, and finally on the above lack of transparency, resulting in non-compliant implementation of the relevant WTO guidelines, the WSC requests the immediate elimination of remaining tariffs on MCOs.

The WSC welcomes the invitation by GAMS to provide updates on advances in semiconductor with a view to maintaining duty-free treatment on semiconductors as technology evolves. The WSC supports the continuous update of the ITA product scope to include new and evolving semiconductor technologies, as this would help ensure that the ITA stays up to date, would minimize administrative burden and ensure a barrier-free movement of goods across borders. A number of semiconductor products are not covered by the ITA and ITA expansion. The WSC continues to work on suggestions for future updates to the ITA scope. When Government/Authorities decide to update the ITA, the WSC will support the negotiations.

The WSC welcomes the GAMS' call to all ITA-1 members to adopt the ITA-expansion without delay. Broader membership in ITA and ITA expansion will more quickly intensify the benefits of the ITA for all members.

WSC requests GAMS members to include commitments to join ITA and ITA expansion in trade agreements to which they are parties, including the WTO e-commerce initiative currently being negotiated by seventy-six WTO members.

B. Semiconductor-based transducers

As the WCO approaches its final approval of the 2022 amendments to the HS Nomenclature, the WSC reiterates its appreciation for the GAMS' endorsement of the WSC definition proposal to amend HS heading 8541 by including semiconductor-based transducers.

The WSC welcomes the progress made in the World Customs Organisation (WCO) on the semiconductor-based transducers amendment. **The WSC urges GAMS to continue to support the proposal and cooperate with its Customs agencies to ensure that WCO Council approves the corresponding amendment to heading 8541 in its June 2019 meeting so that it can be implemented within the HS 2022 review.**

The WSC has prepared Annex 2 a proposal for HS Explanatory Notes for semiconductor-based transducers and shared it with GAMS and WCO**.** The WSC stands ready to provide technical support to Customs agencies and WCO as appropriate during the review of the proposal. **The WSC calls on GAMS to support the WSC proposal for Explanatory Notes for semiconductor-based transducers and work with their Customs agencies to ensure WCO's approval of the proposal within the HS 2022 review.**

WSC recalls the 2017 GAMS Busan understanding that tariffs should not increase irrespective of changes to the HS. Based on this agreement, tariffs on semiconductor-based transducers should not increase with the entry into force of the HS 2022.

C. Trusted Traders

The semiconductor industry relies on a unique and global manufacturing process and supply chain. A typical semiconductor device will cross international borders many times during manufacturing. The industry is significantly dependent on smooth international movement of goods and as such has been investing substantially to comply with trusted traders' policies worldwide, such as the Authorised Economic Operators' (AEO) programs. These policies aim to enhance compliance and supply chain security coupled with bolstering smooth, fast and

efficient import and export processes. Most semiconductor companies have achieved AEO status, many of them in multiple jurisdictions worldwide.

The WSC welcomes the GAMS' support for enhanced cooperation with customs authorities to strengthen trusted traders' programmes and enhance tangible trade facilitation for trusted traders. The WSC supports the GAMS acknowledgment of the importance of global alignment of compliance and supply chain security programmes, and their further mutual recognition.

In response to the GAMS request, in 2018 the WSC articulated best practices on AEO/Trusted Traders programs. In addition, as per GAMS' recommendation in 2017 and 2018 the WSC endeavours to organise a separate meeting in April 2020 in Brussels, with all Customs agencies from the GAMS regions. The meeting will initiate a dialogue on AEO/Trusted Traders between the WSC and Customs administrations on how to work to the goal of furthering the WSC Best Practices and foster trade facilitation for AEOs while ensuring an international level playing field. **The WSC calls on GAMS to work with their Customs agencies to ensure Customs officials from all regions actively participate in the meeting.**

D. Duty-Free Treatment for Electronic Transmissions

The duty-free movement of electronic transmissions within and across borders has facilitated technological innovation and the growth of the digital economy. For the semiconductor industry, the seamless and unimpeded flow of semiconductor research, designs, software, manufacturing information and other data has been critical to the growth of our industry. To prevent the deceleration of the digital economy and avoid undermining R&D and technological innovation, countries should continue to refrain from the imposition of duties, tariffs and/or taxes on electronic transmissions.

The WSC emphasizes the huge practical and technical difficulties administrations and businesses would face in imposing and complying with any duties on electronic transmissions. Such duties would be in practice impossible to

achieve or would create extremely high burdensome requirements to Customs agencies and industry.

The WSC therefore requests the GAMS to support and negotiate at the WTO a continuous extension of a ban on duties, tariffs and other taxes on electronic transmissions, including content transmitted electronically.

VII. Encryption Certification & Licensing Regulations

The WSC appreciates the GAMS roundtable on Encryption held on October 17, 2018. The roundtable was a welcomed further step to enhance the dialogue on regulatory practices on commercial encryption based on concerns expressed by the WSC.

The semiconductor industry provides the fundamental building blocks for today's developments in information technology, including in innovation areas such as connectivity and infrastructure, IoT, medical devices, AI, cloud computing, connected vehicles, connected homes and big data. As such, semiconductors are increasingly ubiquitous.

The WSC highlights the importance of the review by GAMS of the global regulatory environment for encryption based on the WSC Encryption Principles, which emphasize market access, non-discrimination, transparency, adoption international standards, and open procedures and rules. As highlighted by GAMS, Governments should take the Principles into account to avoid a negative impact on the industry's competitiveness and prevent unnecessary restrictions to trade.

The WSC welcomes the GAMS' conclusions that consensus-based international standards adopted through open procedures are the optimal way to achieve robust cryptographic solutions and trusted security technologies containing encryption. In addition, the WSC highlights the importance of meaningful stakeholder consultation whenever rules on encryption are created or revised, as highlighted by GAMS.

The WSC believes the ongoing information exchange between GAMS on existing and draft regulatory practices on encryption is key to enhance mutual understanding and cooperation.

The WSC notes the progress made in the self-assessment exercise. Some associations believe there is room for improvement, and all associations commit to provide high-quality information. Each association will provide its respective GAMS with the current results of the self assessment as well as the initial assessment expressed.

WSC calls on GAMS to continue the dialogue by assessing and analysing encryption regulatory practices with respect to conformity to the WSC Encryption principles, also through intensified and regular inter-sessional work, in order to increase transparency.

The WSC supports the decision by GAMS to organize an Encryption Workshop in 2019, presented a proposed agenda to such workshop （Annex 3）, and requests that GAMS assess and analyse during the workshop the results of the self-assessment and the information exchanged, against the WSC Encryption Principles. To support this process, the WSC endeavours to provide GAMS with a summary of all self-assessments prior to the intersessional / workshop.

VIII. Regional Support Programs

The WSC welcomes GAMS' support for full implementation of the *Regional Support Guidelines and Best Practices*, which reflect the shared view that government support in the semiconductor sector should be transparent, non-discriminatory, and non-trade distorting, and that the government actions should be guided by market based principles, and competitiveness of companies and their products, not the intervention of governments and authorities, should be the principal driver of innovation, industrial success and international trade.

The WSC has noted a significant increase in government actions that are not consistent with the principles of the *Regional Support Guidelines* to the semiconductor industry in recent years. The WSC reiterates its concerns that non-transparent and non-market-based support or actions by governments/authorities

and government-related entities that are not consistent with the principles of the *Regional Support Guidelines* will have a significant disruptive impact on the development of the semiconductor industry. Such practices may raise the concern of capacity that is not commercially justified, create unfair competitive conditions, hinder innovation, and undermine the efficiency and stability of global value chains. The WSC welcomes the October 2018 GAMS agreement to work together to maintain the effectiveness of existing WTO disciplines, as well as to reform the WTO to help it meet new challenges.

Recognizing the important role of transparency for developing market-based responses by industry and government to changing market conditions, the WSC welcomes the GAMS' commitment to increase transparency through regular information sharing and review. WSC members, in consultation with their respective GAMS members, have provided self-notifications of five programs or measures per jurisdiction. The WSC presents the latest "package" of self-notification information, attached to the Cover Note to GAMS. This updated package consolidates information shared among WSC and GAMS members based on written input, information shared at the 2018 GAMS workshop, and publicly available information.

The WSC requests GAMS to review these actions with respect to consistency with the *Regional Support Guidelines and Best Practices* at the 4th Workshop on Regional Support at the 2019 GAMS Meeting.

The WSC presents to GAMS its proposed workshop agenda (Annex 4), and requests that GAMS members identify and invite appropriate officials in their regions to participate in this workshop.

The WSC requests GAMS to continue and review the process of regular exchanges in support of full implementation of the Regional Support Guidelines.

IX. Semiconductor Market Data

The WSC reviewed the semiconductor market report covering global market size, market growth, and other key industry trends. According to WSTS data, in 2018, the semiconductor market continued rapid growth with a recorded value of US$468.8 billion and grew year over-year by 13.7 percent. The Asia Pacific and China markets accounted for more than 60% of the global market, China still remains the largest region. With respect to applications, the automotive end use

sectors had the highest growth rates but the communication (32.4 percent) and computer (30.8 percent) segments remained the largest. Among the semiconductor product categories, Memory was the fastest growing with sales increasing by 27.4 percent and the largest semiconductor category by sales with $158.0 billion, followed by discrete semiconductors with a 11.3 percent growth rate and logic with a 10.8 percent growth rate.

X. Approval of Joint Statement and Approval of Recommendations to GAMS

The results of today's meeting will be submitted by representatives of WSC members to their respective governments/authorities for consideration at the annual meeting of WSC representatives with the Governments/Authorities Meeting on Semiconductors (GAMS) to be held in October 2019 in Honolulu, United States.

XI. Next Meeting

The next meeting of the WSC will be hosted by the Semiconductor Industry Association in Chinese Taipei and will take place in Taipei, Taiwan on May 19-22, 2020.

XII. Key Documents and WSC Website:

All key documents related to the WSC can be found on the WSC website, located at: http://www.semiconductorcouncil.org

Information on WSC member associations can be found on the following websites:

Semiconductor Industry Association in China:
http://www.csia.net.cn

Semiconductor Industry Association in Chinese Taipei:
http://www.tsia.org.tw

Semiconductor Industry Association in Europe:
http://www.eusemiconductors.eu

Semiconductor Industry Association in Japan:
http://semicon.jeita.or.jp/en/

Semiconductor Industry Association in Korea:
http://www.ksia.or.kr

Semiconductor Industry Association in the US:
http://www.semiconductors.org

Annexes:

1. **Abusive Patent Litigation (Including NPEs/PAEs): Best Practices to Combat Abusive Patent Litigation**
2. **HS Explanatory Notes for semiconductor-based transducers**
3. **Proposed Agenda for GAMS Workshop on Encryption**
4. **Proposed Agenda for GAMS Workshop on Regional Support**

Annex 1

Abusive Patent Litigation (Including NPEs/PAEs): Best Practices to Combat Abusive Patent Litigation

Over the last ten years, governments and authorities in various WSC member countries and regions have devoted, and continue to devote, significant focus and effort to the study of the impact of abusive litigation practices, including the impact of non-practicing patent entities (NPEs) and patent assertion entities (PAEs) on the economies and national legal systems of their jurisdictions.

The WSC, for its part, adopted in 2014 a series of specific recommendations addressing this issue, encouraging governments and authorities to adopt appropriate and balanced policies and legislative measures to regulate abusive litigation by patent holders, in order to help advance innovation and improve overall patent systems. In recent years, various governments/authorities have issued official statements of policy; proposed legislation; conducted economic studies; and enacted legislation directed at the economic and legal impact of such entities. The approach of different countries and regions, however, has varied, and not all countries and regions have fully implemented the WSC's recommendations.

Given this uncertain state of development and the continued harmful impact of abusive patent litigation practices (including NPEs/PAEs) on the semiconductor manufacturing industry, it is in the WSC's interest to share "best practices" in dealing with this issue. In its 2016 Chairman's Summary, the GAMS invited the WSC to undertake such an effort:

> *GAMS . . . invites WSC to share best practices on this issue {continuing problems caused by abusive patent litigation (including NPEs/PAEs)} and to report on these at the next GAMS meeting.*
>
> (Government/Authorities Meeting on Semiconductors, Chairman's Summary, Berlin, Germany, Oct. 20, 2016)

In response to the GAMS' invitation to share "best practices" on this issue, the WSC recommends the following best practices to reduce the potential for harm from abusive patent litigation conduct (including by NPEs/PAEs):

1. Timing of Damages and/or Permanent Injunction: Practices to ensure that damages and/or permanent injunction is not granted before both infringement and invalidity proceedings on a patent are concluded. Avoids abusive patent practices of trying to collect damages or having permanent injunctions granted on an invalid patent.

2. Standard for Injunctions: Injunctions should not be granted unless the plaintiff can show that it will suffer irreparable injury, the remedies available at law are inadequate to compensate for that injury, the balance of hardship between the parties favors the grant of an injunction, and the public interest would not be disserved.

3. "Forum Shopping": Practices that prevent abuses in which plaintiffs "forum shop" to select "patentee-friendly" courts in which the plaintiff is more likely to ultimately prevail or at least obtain a preliminary injunction. Such initiatives may include, where practicable and effective, establishing courts with specialized patent expertise or addressing inequalities in venue selection that lead to abusive "forum shopping."

4. Fee Shifting with Bonds: Practices that, in addition to encouraging fee shifting, require up front bonds or alternatively provide for other sufficient evidence to ensure the plaintiff could pay fee shifting costs should they apply. Otherwise, abusive patent litigators underfund themselves and simply declare bankruptcy if hit with paying the other side's fees.

5. Means to Challenge Patent Validity: Practices that provide a fair, speedy, and cost-efficient means to challenge patent validity, such as the use of *inter partes* review (IPR) or other post-grant review procedures.

6. Publication of Pleadings and Opinions: Practices that require publication of non-confidential copies of pleadings and opinions, with a process for redacting any sensitive and/or confidential information belonging to the parties.

7. Defense Collaboration: Practices that encourage lawfully permissible collaboration among defendants being sued by the same plaintiff under the same patent, e.g., under a joint defense agreement, to ensure that the best defense possible is developed.

8. Real Parties in Interest: Practices that require the disclosure of the appropriately defined real parties-in-interest in litigation (see, e.g., WSC 2014 Joint Statement recommendation for greater patent ownership transparency in lawsuits).

9. Discovery Burden and Cost Asymmetries: Practices that encourage case management procedures to address discovery burden and cost asymmetries in NPE/PAE litigation (see, e.g., WSC 2014 Joint Statement recommendation to implement appropriate revisions and limits to discovery procedures).

10. Sufficiency of Pleadings: Practices that provide procedures to challenge the "plausibility" of pleadings in patent cases and to ensure that patent infringement complaints provide sufficient notice to accused infringers (see, e.g., WSC 2014 Joint Statement recommendation for heightened pleading requirements for patent lawsuits).

The WSC appreciates the invitation of the GAMS to identify the above best practices on the issue of abusive patent litigation (including NPEs/PAEs) and welcomes the opportunity for further discussion with GAMS on the most effective means to implement these best practices.

Annex 2

HS Explanatory Notes for semiconductor-based transducers

"Semiconductor devices" are semiconductor devices the operation of which depends on variations in resistivity on the application of an electric field or semiconductor-based transducers. Semiconductor devices may also include assembly of plural elements, whether or not equipped with active and passive device ancillary functions.

"Semiconductor-based transducers" are, for the purpose of this definition, semiconductor-based sensors, semiconductor-based actuators, semiconductor-based resonators and semiconductor-based oscillators, which are types of discrete semiconductor-based devices, which perform an intrinsic function, which are able to convert any kind of physical or chemical phenomena or an action into an electrical signal or an electrical signal into any type of physical phenomenon or an action.

All the elements in semiconductor-based transducers are indivisibly combined, and may also include necessary materials, active or passive discrete components indivisibly attached, that enable their construction or function. Non-based semiconductor elements are allowed to be part of the transducer in case they enable or support the functionality of the transducer. Such typical elements are as follows but not limited to, e.g. the package, which typically consists of metal wires for interconnect, a leadframe, an encapsulation, substrates etc. or elements which enable or support the function like magnets, optical elements etc. are all accepted parts of the transducer even if they are not mentioned..

The components forming a semiconductor-based transducer must be combined to all intents and purposes indivisibly, i.e., though some of the elements could theoretically be removed and replaced, this would be uneconomic under normal manufacturing conditions.

The following expressions mean:
(1) "Semiconductor-based" means built or manufactured on a semiconductor substrate or made of semiconductor materials, manufactured by semiconductor technology, in which the semiconductor substrate or material plays a critical and

unreplaceable role of transducer function and performance, and the operation of which is based on semiconductor properties including physical, electrical, chemical and optical properties.

Thus, the definition shall also include elements in which the semiconductor material provides functionality to the transducer by its properties, which are not only semiconductor-specific. Such properties are e. g. mechanical strength, flexibility, thermal conductivity, optical reflectivity, chemical resistivity, etc. in combination with its ability to be manufactured with high precision on a micro meter scale by using semiconductor technology (micro machining). Such elements are for example membranes, bars, cantilevers, cavities, mirrors, channels, etc., which enable MEMS functions by thickness or elastic flexibility).

The materials used in semiconductor-based transducers should be those that are currently widely used, which refer to Silicon (Si), Germanium (Ge), Carbon (C), Silicon Germanium (SiGe), Silicon Carbide (SiC), Gallium Nitride (GaN), Gallium Arsenide (GaAs), Indium Gallium Arsenide InGaAs , Gallium Phosphide (GaP), Indium Phosphide (InP), Tin Telluride (SnTe), Zinc Oxide (ZnO) and Gallium Oxide (Ga2O3)".

Manufactured by semiconductor technology means the application of area processing on a wafer level which includes among others (not limited to) grinding, polishing, doping, spin coating, imaging, CVD, PVD, galvanic, developing, stripping, etching, baking, printing.

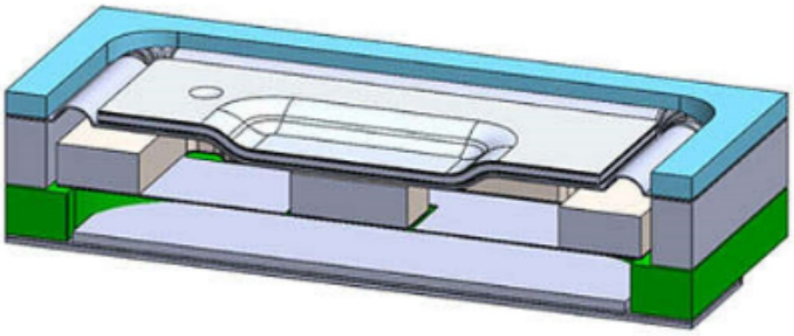
(2) "Physical or chemical phenomena" relate to phenomena, such as pressure, acoustic waves, acceleration, vibration, movement, orientation, strain, magnetic field strength, electric field strength, light, radioactivity, humidity, flow, chemicals concentration, etc.

(3) "Semiconductor-based sensor" is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of detecting physical or chemical quantities and converting these into electric signals caused by resulting variations in electric properties or displacement of a mechanical structure.

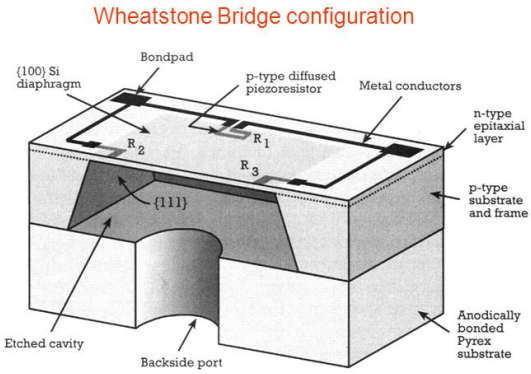
Examples:

Physical appearance:

A MEMS speaker makes use of a diaphragm (which vibrates and actually produces sound)



A MEMS pressure sensor is often placed in a package with a tube (cavity) on top in order to accurately measure pressure:

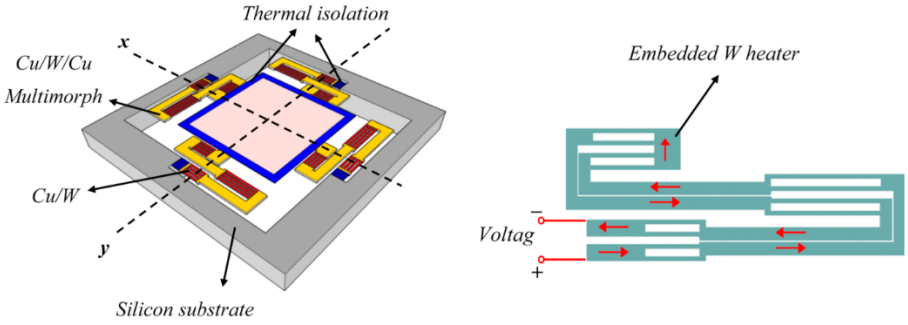


Piezoresistive pressure sensor (using piezoresistive effect of silicon), from: “an Introduction to MEMS Engineering”, N. Maluf.

(4) “Semiconductor-based actuator” is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of converting electric signals into physical movement.

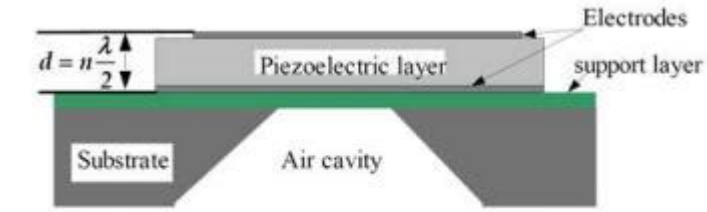
Examples:

Physical appearance:



Electrothermally actuated MEMS Mirror. From: Micromachines 2015, 6(12), 1876-1889; doi:10.3390/mi6121460

(5) "Semiconductor-based resonator" is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of generating a mechanical or electrical oscillation of a predefined frequency that depends on the physical geometry of these structures in response to an external input.



Film Bulk Acoustic Resonator (FBAR)-BAW Filter – Cross-Section view (2)

FBAR (film bulk acoustic wave resonators) as used in RF technology for multiplexing or channel select in wireless devices.

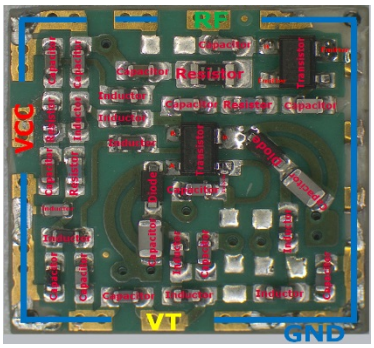
(6) "Semiconductor-based oscillator" is a type of semiconductor device, which consist of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of generating a mechanical or electrical oscillation of a predefined frequency that depends on the physical geometry of these structures.

Examples:

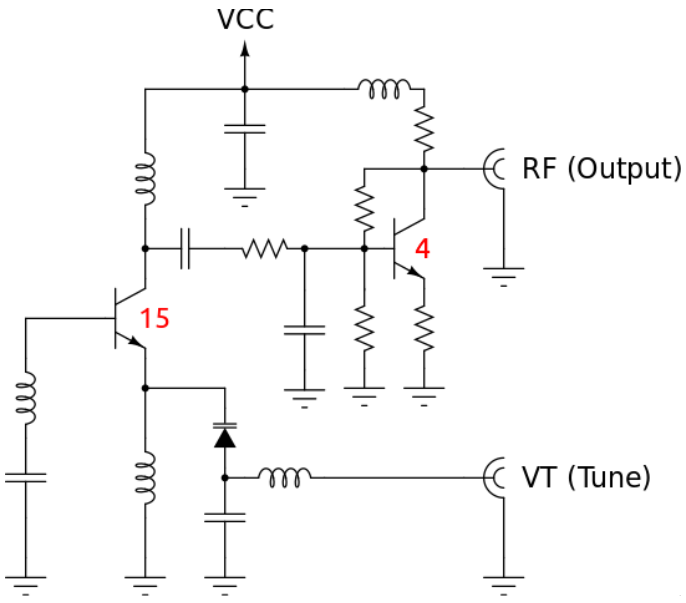
Physical appearance:

Typical physical appearance of a packaged oscillator

View on components upon the decapsulated package:



Simplified Block diagram:



Functionality:

„The oscillator converts physical phenomena (stored energy of electromagnetic fields inside a resonator) in electrical signal (output voltage with frequency depending on tuning voltage).

Annex 3

GAMS Workshop on Encryption

Wednesday, October 16th, 2019, US

Draft Agenda

13:30 – 13:35	Opening remarks	GAMS Chair (US)
13:35 – 14:00	Presentation: • The WSC Encryption Principles • WSC Self-Assessment • State-of-play and assessment	WSC Encryption Task Force Chair (SIA in Europe)
14:00 - 15:00	Individual presentations by WSC member associations *Focus on summary of analysis of self-assessment results* • SIA in Europe • SIA in the US • SIA in Korea • SIA in Japan • SIA in China • SIA in Chinese Taipei Q&A Session	WSC delegates GAMS delegates
15:00 - 15:15	Coffee Break	
15:15 - 17:45	GAMS assessment of the information exchange against the WSC Principles	GAMS delegates only

Annex 4

Proposed Agenda for GAMS Workshop on Regional Support
October, 2019

Time	Meeting	Speaker
9:00-9:10	Welcome and Introduction by GAMS Chair	US GAMS Chair
9:10-9:25	WSC Presentation/Remarks	Regional Support TF Chair
9:25-9:45	WSC Guidelines & Best Practices	Moderator
Morning Session: Analysis and Assessment of Regional Support Programs against WSC/GAMS Regional Support Guidelines & Best Practices		
9:45-11:15	Summary and review of Regional Support Programs: Regions 1-3	GAMS/Program Managers (Regions 1-3)
11:15-11:30	Break	
11:30-13:00	Summary and review of Regional Support Programs: Regions 4-6	GAMS/Program Managers (Regions 4-6)
13:00-14:30	Lunch	
Afternoon Session: Implementing GAMS Guidelines & Best Practices		
14:30-16:00	Panel Session: GAMS Guidelines and Best Practices: Global/Regional Developments	Government, industry, academic experts
16:00-16:30	Summary & Conclusions	Moderator
16:30-16:45	Closing Remarks, Adjourn	US GAMS Chair