FINAL

JOINT STATEMENT OF THE 15TH MEETING OF THE WORLD SEMICONDUCTOR COUNCIL (WSC)
MAY 26, 2011
FUKUOKA

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 15th meeting of the World Semiconductor Council (WSC) today. This meeting, held in Fukuoka, Japan, was conducted under the "Agreement Establishing a New World Semiconductor Council" approved at the third WSC meeting and signed on June 10, 1999, and amended on May 19, 2005.

The WSC meets annually to bring together industry leaders to address issues of global concern to the semiconductor industry. The WSC has the goal of promoting cooperative semiconductor industry activities, to expand international cooperation in the semiconductor sector in order to facilitate the healthy growth of the industry from a long-term, global perspective. It also supports expanding the global market for information technology products and services. Further, it promotes fair competition, technological advancement, and sound environmental, health and safety practices. The WSC encourages cooperation in such areas as environment, safety and health practices, protection of intellectual property rights, open trade, investment liberalization, and market development. All WSC activities are guided by a basis of fairness and a respect for market principles consistent with World Trade Organization (WTO) rules and WSC member association bylaws. The WSC reaffirmed that markets should be open and competitive. Antitrust counsel was present throughout the meeting.

The meeting was chaired by Junshi Yamaguchi of Renesas Electronics Corporation for the Semiconductor Industry Association in Japan, who welcomed the delegates to Fukuoka. Regional delegations attending the meeting were chaired by David Wang of SMIC, Rick Tsai of TSMC, Enrico Villa of ST Microelectronics, Oh Hyun Kwon of Samsung Electronics and Ray Stata of Analog Devices Inc.

During the meeting, the following reports were given and discussed, and actions on these were approved:

Free and Open Markets

(1) Multichip and Multi-component ICs

(a) MCP

The WSC takes note of the 2009 GAMS Chair's Summary and acknowledges that it has clearly established that this is currently an issue to be addressed at GAMS level.

The WSC notes furthermore that the 2010 Chair's Summary has reconfirmed that accession of all current GAMS members is a matter of critical importance, and has noted that the IT industry will be a driver of economic development and that is important to create a favorable environment for investors and producers by joining the Agreement.

The WSC recommends that the GAMS continue to work to expand the current geographic scope of the 2006 MCP agreement. The WSC appreciates the possibility that certain non-GAMS members may join the agreement. Against this background, WSC considers it of particular importance that all current GAMS members join the agreement. The WSC calls upon all GAMS members to consider pragmatic approaches to facilitate this objective.

In order to achieve expansion of the geographical coverage of the MCP agreement, the WSC recommends the inclusion of this agreement into multilateral agreements such as the ITA, the Doha/NAMA, or other multilateral Free Trade Agreements.

(b) MCO

WSC calls upon GAMS to continue to facilitate the growth of the semiconductor market by ensuring free and open markets by eliminating tariffs and non-tariffs barriers for all semiconductor products including new types of semiconductor products such as multi-components ICs.

WSC highly appreciates the agreement among GAMS to move forward on MCO.

WSC welcomes the recognition by GAMS of the social contribution of semiconductors and in particular of MCO ICs. WSC further appreciates the commitment to facilitating the growth of the market for such semiconductor products through an agreement on zero duties with an appropriate definition by September 2011.

WSC highly appreciates the existing cooperation between customs officials and the GAMS trade experts as well as the efforts by GAMS to involve all GAMS members in the discussions.

WSC understands that an agreement on MCO ICs among GAMS members is now well advanced. It encourages all GAMS members to conclude the ongoing technical discussions involving all geographies to agree before the September 2011 GAMS meeting on a definition of Multi-component ICs, covering current and future semiconductor products, with an eye to conclude at that meeting a tariff elimination agreement for these products.

To this end, WSC would strongly support that a specific GAMS-initiated meeting to resolve pending technical issues be held prior to the September 2011 GAMS.

In support of this objective, industry remains ready to contribute to such technical discussions and provide further expertise to GAMS and/or Customs officials as appropriate.

The WSC also reiterates the importance of defining MCOs within the terminology of HS nomenclature and requests GAMS to address this task with a view to providing such language to the WCO for classification under HS2017.

(2) Encryption Standards and Regulations

WSC confirms and re-iterates its 2010 statement on Best Practices in regard to Encryption certification & licensing regulations.

In regard to international norms and practices WSC provides the following clarification and statement:

- International

  Something (a company, language or organization) international mostly means that it involves more than one nation (country). The term international as a word means involvement of, interaction between or encompassing more than one nation, or generally reaching beyond national boundaries. For example, international law, which is applied by more than one country over the world, and international language which is a language spoken by residents of more than one country.

- International Standards

  International standards are standards developed by international standards organizations, which are open to all Members of the World Trade Organization or to most countries of the world. Notable examples of international standards bodies are the International Organization for Standardization (ISO) or the International Electrotechnical Commission (IEC).

  WSC supports and calls upon government authorities to follow the principles and procedures which have been decided by the WTO Technical Barriers to Trade Committee[1], when international standards are elaborated by its members.

Examples of security related norms and practices are:

Common Criteria (international standard)

The Common Criteria for Information Technology Security Evaluation (abbreviated as Common Criteria or CC) is an international standard (ISO/IEC 15408) for computer security certification. All testing laboratories must comply with ISO 17025, and certification bodies will normally be approved against either ISO/IEC Guide 65 or BS EN 45011.

Mutual Recognition Agreement (Plurilateral agreement)

As well as the Common Criteria standard, there is also a sub-treaty level Common Criteria MRA (Mutual Recognition Agreement), whereby each party thereto recognizes evaluations against the Common Criteria standard done by other parties. Originally signed in 1998 by Canada, France, Germany, the United Kingdom and the United States, Australia and New Zealand joined 1999, followed by Finland, Greece, Israel, Italy, the Netherlands, Norway and Spain in 2000. The Agreement has since been renamed Common Criteria Recognition Arrangement (CCRA) and membership continues to expand.

Other arrangements and criteria such as Wassenaar Arrangement would be discussed further at the Encryption Certification and Licensing Task Force.

(3) Rules of Origin (as a continuing issue)

In the GAMS meetings 2008 and 2009 the WSC has re-iterated its position in regard to non preferential Rules of Origin. WSC has stated that for semiconductor products it strongly supports the principle of harmonized rules of origin for trade remedies and for customs purposes, and in the view of characteristics of semiconductor products rules of origin should be defined by manufacturing processes (diffusion or assembly) and not defined on a value-added (VA) basis.

In 2010, the WSC decided to put this topic on hold until relevant issues (such as progress within WTO or changes in legislation in the regions in regard to RoO or marking/labeling) occur. While emphasizing the need of urgency for unified rules of origin at the WTO, WSC noted that the above situation remains unchanged.

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[1] Source: Second Triennial Review of the Operation and Implementation of the Agreement on Technical Barriers to Trade, Annex 4, G/TBT/g, WTO Committee on Technical Barriers to Trade (13th November 2000)

The WSC re-confirms its desire to further support the ongoing harmonization process whenever it will be required. The WSC will stay in close contact with GAMS members to monitor any progress or changes on this subject.

Conflict Minerals

WSC acknowledges public concerns and recent governmental actions to address conflict minerals and will continue to monitor these developments.

As potential regulations and guidance are considered by governments and authorities, WSC recommends a coordinated approach to this matter – one that takes into account global industry-led initiatives to identify conflict-free smelters.

Export and/or Import Regulatory Restrictions

While governments around the world have controls on exports based on multilateral conventions and for a variety of reasons, such as to prevent disturbance of the peaceful coexistence between nations or to prevent major disruptions in foreign relations, export control implementation worldwide should be transparent and minimize burdens, delays, and other disruptions to trade. The WSC acknowledges and welcomes current government level discussions on this topic to reflect industry's concerns. Industry is willing to support and contribute to such discussions if requested. WSC encourages GAMS to convey this statement to relevant government officials.

Doha/WTO

Given that semiconductors provide the key enabling technology for existing and new information technology (IT) products, it is vital that trade in semiconductor products, equipment and materials as well as other IT products is as open as possible and that international rules and domestic regulations foster an open and competitive market.

The WSC strongly supports zero tariff treatment on semiconductors and opposes any tariff and non-tariff barriers related to these products. To this end, the WSC urges GAMS to achieve zero tariff treatment on these products by successful conclusion of the WTO NAMA Electronics/Electrical Sectoral Initiative. The Doha Round should become a true development Round with a far more ambitious outcome. Enhanced growth in GDP in all countries requires free trade – that is, no tariff or non-tariff barriers – on information, computing and telecommunications (ICT) products and services.

The increased deployment of ICT products and services will accelerate economic growth rates in developing economies.

To realize these objectives, the WSC recommends members of the GAMS to make every effort to accelerate Doha negotiations to realize zero tariffs and removal of non-tariff barriers for IT products.

Information Technology Agreement (ITA)

Access to advanced and affordable semiconductor products promotes economic development by increasing productivity and providing the infrastructure needed to compete in the digital age.

The WSC advocates that the GAMS enhance its support for the development of the trade of IT products by actively promoting that new types of semiconductors like MCPs and MCOs are included in any effort to expand the scope of the ITA through the agreement review process or other means and through the expansion of ITA membership.

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) Emission Reduction

The global semiconductor industry is a very minor contributor to overall emissions of greenhouse gases, and the industry is continuously working to reduce further 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 is pleased to announce that the WSC has met this goal – indeed, the industry has far surpassed this goal. Over the 10-year period, the WSC has achieved a 32 percent reduction. This achievement demonstrates the sincere effort of the semiconductor industry to innovate and voluntarily reduce emissions even while substantially increasing output. More detail on the achievement of this goal is set forth in Annex 1.

The WSC now intends to build on this success with a new voluntary PFC agreement for the next 10 years. The elements of the 2020 goal include the following:

- 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 $kgCO_2e/cm^2$, which is 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 ($kgCO_2e/cm^2$) that will be a single WSC goal at the global level.

The WSC will report its progress on this voluntary agreement on an annual basis. This external reporting will provide aggregated results of the absolute PFC emissions and NER trends.

(2) PFOS (Perfluorooctyl Sulfonates) Reduction

As part of the WSC's proactive approach to sound Environment, Safety and Health (ESH) practices, in 2006 the WSC, in conjunction with the association of suppliers of semiconductor equipment, SEMI, announced a plan to end non-critical uses of perfluorooctyl sulfonate (PFOS) chemicals in semiconductor manufacturing and to work to identify substitutes for PFOS in all critical uses. Very small amounts of PFOS compounds are critical ingredients in leading edge photoresists and antireflective coatings, materials used in the photolithographic process for imprinting circuitry on silicon wafers.

WSC is pleased to announce that the industry has successfully eliminated all non-essential uses of PFOS and identified substitutes for most other uses, although continued use of very small quantities of PFOS remains critical in a few remaining processes. The remaining uses of PFOS are limited and highly controlled, and emissions of PFOS by the semiconductor industry have been reduced to approximately 6 kg/year. For more information on the work of WSC on PFOS, see Annex 2.

In light of this success, WSC is announcing the conclusion of the work of its PFOS working group. Because of the continued importance of continued leadership in the environmental stewardship of chemicals used in the semiconductor industry, the WSC announces the formation of a chemicals working group to address these issues. This working group will be chaired by the Semiconductor Industry Association in the United States.

(3) Energy Savings in Semiconductor Manufacturing

The energy consumed in the semiconductor manufacturing process is an important focus of the industry's environmental and sustainability practices worldwide. While the industry's energy consumption is relatively small, and is more than compensated by the energy efficiency benefits of semiconductors as deployed in a wide-range of products, reducing energy consumption provides significant environmental benefits and opportunities for cost savings.

The WSC continues to focus on our goals of reducing greenhouse gas emissions and energy consumption in the manufacture of semiconductors and will work on technical aspects with our suppliers to evaluate cost-effective improvements to existing tool-equipment sets and establish active and meaningful optimization goals as part of new equipment design.

(4) Quantitative Targets

The WSC members are continuing to focus on resource conservation activities in the production process. The agreed WSC expectation levels, to show progress as an industry, are to reduce normalized electricity (30%), water (45%) used in manufacturing and waste generated (40%) by 2010 from the baseline of 2001. The information collected from the 2010 data, shows that industry expectation levels are being implemented. The normalized reduction (per cm^2 of silicon wafers processed) of electricity was 38%, water used in manufacturing 53%, and waste generated 46%, from the baseline of year 2001. The WSC continues to pursue environmental conservation programs in these areas.

(5) Other Environment, Safety and Health Issues

The WSC has a great interest in addressing the global impact of ESH regulations on our industry and in ensuring that regulatory programs are technologically feasible, coordinated and effective in achieving environmental protection. The WSC believes that when ESH laws and regulations are necessary, they should be technologically feasible in achieving environmental protection. The semiconductor industry has long recognized the importance of proactively protecting the global environment – as is demonstrated by our numerous efforts in this area.

(6) Product Compliance

The WSC agrees that responsible stewardship of the content of our electronic products is good for human health and the environment. However, the WSC also recommends that any government developing and implementing any program or supporting systems or programs for RoHS compliance certification would prove most effective when that government works with industry during the program development.

The WSC also recommends harmonization between any mandatory or voluntary certification procedures already in place in the global community. This would include the recommendation for the use of IEC 62321, or equivalent standard test results, from any ISO 17025 certified test laboratory.

Additionally the WSC is concerned that production delays could result when mandatory and voluntary programs are established that require compliance certification prior to product shipment. In addition, some of the information describing the material used by our industry is considered to be company specific intellectual property, knowhow and trade secrets.

Effective Protection of Intellectual Property

(1) Fighting the proliferation of semiconductor counterfeiting

WSC welcomes and fully supports the conclusions of the GAMS summary of September 2010, and looks forward to supporting and acting upon the countermeasures taken by each region, at domestic, bilateral and multilateral levels, to fight the proliferation of semiconductor counterfeiting.

WSC encourages the participation of customs representatives to deal with this issue in the context of the report to the 2011 GAMS. It reiterates its call for all governments and authorities to implement effective enforcement measures for protection of IP rights within their jurisdiction.

At the same time, WSC acknowledges progress being made in many regions for anti-counterfeiting activities and urges further efforts to be made in all regions. It confirms that results can be achieved through an effective cooperation between the industry and customs officials and enforcement agencies. It also recognizes the benefits of an integrated approach to fighting counterfeiting both at borders and within borders, as seen in the numerous seizures over the past months in several regions. Full customs recordation remains an issue industry needs to address to secure effective seizures.

(2) Patent quality

The WSC's longstanding view is that in order to maximize the beneficial effect that intellectual property protection has on stimulating and sustaining innovation, patent offices around the world should implement examination procedures that result in granting the highest quality patents possible in compliance with the statutory requirements of patentability. Effective quality control in the issuance of patents would also reduce the number of frivolous lawsuits that burden the semiconductor industry and stifle innovation.

The WSC desires to promote a broad and continuing dialogue with the patent offices in GAMS members. Through this dialogue, the WSC hopes to convey the industry’s observations and suggestions regarding issuance of quality patents in the semiconductor area based on the industry's experiences as one of the most patent-intensive and innovative business sectors in the global economy.

Towards this end, last year the WSC members provided to their respective patent offices a country-specific summary of suggestions for improving patent quality and harmonization. The WSC has kept the WIPO apprised of this initiative and will look for ways to cooperate with the WIPO on improving global patent quality.

The WSC is pleased to report that all of the patent offices were open and receptive to these observations and suggestions by the industry. They provided to the respective WSC members useful information about the efforts and plans of the offices to improve patent quality. The WSC, as appropriate, intends to maintain this dialogue by periodically following up with its members and with the patent offices regarding the status of patent examination throughout the world, progress in making improvements, and ideas for enhancing patent quality.

(3) Non-Practicing Entities (NPEs)

The WSC heard a presentation from the JSTC on member associations’ views regarding non-practicing entities who acquire semiconductor IP rights. WSC noted the expressed intention of the Semiconductor Industry Association in Korea to engage a third-party research organization to further study this topic. The WSC expects to hear more on the topic at its 2012 meeting.

Analysis of Semiconductor Market Data

The WSC reviewed a semiconductor market report covering market scale, market growth and other key industry trends. The report found that in 2010 the semiconductor market recovered from the global economic recession of 2008 and 2009 to achieve a record market size. Technological progress should enable the semiconductor industry to continue benefiting consumers and businesses around the world. The WSC also took note of the report’s identification of LEDs and TVs utilizing LED technologies as swiftly growing markets, as well as Smart Cities in which these products are key elements with strong future market potential.

Regional Stimulus

While WSC supports appropriate stimulus measures by the respective governments and authorities, WSC confirms its views that government actions should be guided by market principles and avoid adoption of protectionist or discriminatory measures. WSC confirms that competitiveness of companies and their products, not the interventions of governments and authorities, should be the principal determinant of industrial success and international trade, and that assistance should be provided in a market-oriented fashion. WSC reiterates that stimulus measures that promote the adoption of information technology, green IT, energy savings, and support research and development in particular have the potential to foster growth and benefit society in the years to come. WSC advocates that these policies be sustained. Discussion on this subject will be continued.

Approval of Joint Statement and Approval of Recommendations to Governments/Authorities

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 September 2011 in Arlington, USA.

Next Meeting

The next meeting of the WSC will be hosted by the Semiconductor Industry Association in the US on May 24, 2012.

Key Documents and WSC Website:

Annex 1: Background Document to WSC Post-2010 Agreement on PFC Emission Reductions
Annex 2: Report to WSC on Voluntary Agreement on PFOS
Attachment to Annex 2: PFOS Research and Development Reference

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

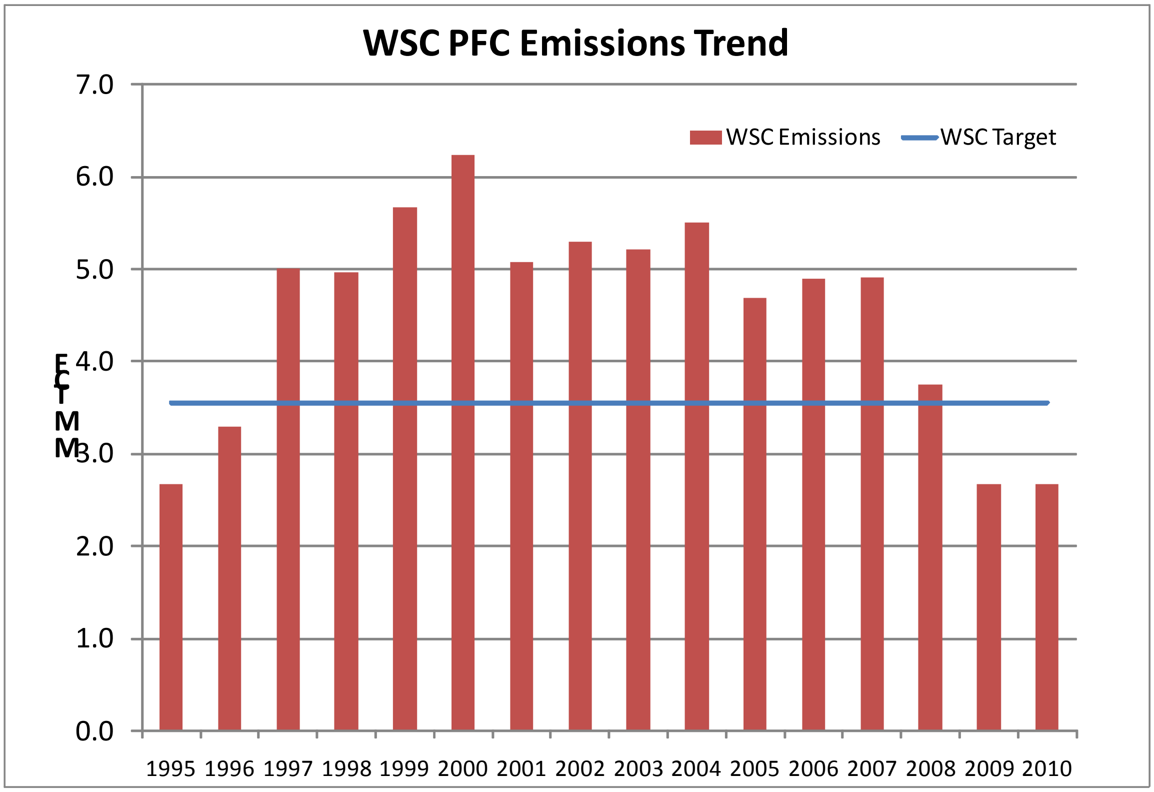
Information on WSC member associations can be found on the following websites:

Semiconductor Industry Association in Europe:	*http://www.eeca.eu*
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 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.sia-online.org*

Annex 1 to WSC Joint Statement: Background Document to WSC Post-2010 Agreement on PFC Emission Reductions

Semiconductor manufacturing was one of the first industries to establish global voluntary reduction targets for PFCs (perfluorocompounds). In 1999, the WSC agreed to reduce PFC emissions by at least 10% below individual baselines for each regional semiconductor association by the end of 2010 (in 1999 the WSC consisted of Semiconductor Industry Associations in the US, Japan, Europe, Chinese Taipei and Korea). The U.S. EPA awarded one of its first Climate Protection Awards to the WSC because of their work on these agreements.

Based on our 2010 results, the WSC associations have successfully showed how industry can voluntarily meet an environmental challenge and achieve extraordinary results. Each of these associations has successfully achieved the reduction targets outlined by the WSC agreement and the total emissions (see chart below) have been significantly reduced below the aggregate target level. The “WSC Target” level on the graph is 10% below the aggregated baseline of all the participating semiconductor associations. The aggregated baseline accounts for differences in the individual WSC associations’ baseline years. Semiconductor Industry Associations in Europe, Japan and the U.S. used 1995 as their baseline. Semiconductor Industry Association in Korea used 1997 and Semiconductor Industry Association in Chinese Taipei used the average of 1997 and 1999. The resulting WSC baseline is 3.9 MMTCE (million metric tons of carbon equivalents), and the WSC Target level is approximately 3.5 MMTCE. Emissions increased from 1995 to 2000 as additional association data were included and production levels increased. From 2000 to 2010 emissions decreased substantially,



**1995 and 1996 emissions do not include Semiconductor Industry Association in Korea data.

By 2010, absolute emissions were reduced 32% below the baseline, to a level of 2.7 MMTCE, surpassing the 10% reduction target. Furthermore, the WSC associations have reduced their combined PFC emissions by approximately 56% below the peak level of the year 2000. This is a significant achievement for the semiconductor industry due to the level of production growth that occurred over the 15 year period from 1995-2010. It is estimated that semiconductor industry production increased roughly 6x over this time period.

These reductions have primarily been achieved through development of new manufacturing techniques, process optimization to use PFCs more efficiently, and application of point-of-use abatement devices. The members of the WSC have collaborated with our regional governments, suppliers of manufacturing equipment and material, research institutions and industry consortia to accomplish this goal. In addition, within the WSC we have created an open and collaborative platform for sharing information that has enabled a highly globalized industry to promote a “level playing field” where cooperation on environmental, safety and health matters is coupled with a fiercely completive global market place.

The WSC now seeks to build on this success with a new goal for the next 10 years. Post-2010, the industry has decided to develop a new goal based on a normalized (relative to production levels) target for the total WSC in order to reflect the industry’s effort on PFC reduction more accurately. The target will be based on the difference between normalized emissions rates (NER) in 2010 compared with the normalized rate in 2020. In addition, the industry has established best practices for new manufacturing capacity that will continue to improve the efficiency of the use of PFC materials within the industry.

The normalized emission rate will be defined as kg CO_2 equivalent (“CO_2-e”) of PFC emissions per square centimeter of silicon wafers produced in our Fabs. This goal will cover Fabs located in all WSC regions as well as the “Rest of World” (i.e., fabs located in other regions that are operated by a company from a WSC region).

The WSC believes that moving to a NER-based target effectively demonstrates our efforts to reduce PFC emissions for the following reasons:

- NER is an effective metric for demonstrating continuous improvement in the efficiency of our manufacturing processes. As the industry continues to move to more advanced manufacturing processes (~ every 2-3 years), PFC emissions are reduced for the products we manufacture through optimization of our manufacturing processes and waste gas treatment. This leads to lower emissions per wafer and therefore a lower NER.
- NER allows us to better account for the growth of the semiconductor industry. As the industry expands globally, NER is a better tool to add in new geographies because it takes regional changes in manufacturing into account. This is also one of the primary reasons for applying the new target to the total WSC rather than setting new goals at the regional association level.
- Applying NER should also avoid any artificial reductions in absolute emissions from industry downturns.

The semiconductor industry believes that utilizing a normalized metric instead of an absolute metric is appropriate at this time due to various circumstances. First, as the semiconductor industry continues to expand into new geographies, the normalized metric will enable the reduction goal to encompass the WSC regions as well as the “Rest of World” (fabs located in other regions that are operated by a company from a WSC region). Thus, this approach has the advantage of providing the opportunity to share Best Practices to continue to influence emission reductions in both existing and new facilities. Second, a normalized metric is appropriate due to the significant absolute reductions already achieved by WSC members over the past 10 years and the resulting limitations on additional future reductions. Therefore, our focus is on continuing to reduce the amount of emissions emitted for the products we manufacture and sharing the knowledge that has been gained over the last 10 years with emerging regions where the opportunities for greater reductions are more substantial.

In summary, the semiconductor industry has demonstrated leadership over many years in the area of global climate protection and has achieved results that validate our commitment to environmental stewardship. Moving to an NER-based target will allow the industry to expand its leadership into new geographies and continue to lead industries in the area of global warming emissions reductions.

Annex 2 to WSC Joint Statement: Report to WSC Voluntary Agreement on PFOS

As part of the WSC's proactive approach to sound Environment, Safety and Health practices, members of the WSC and SEMI endorsed a plan at the May 2006 meeting which applies to both critical and non-critical photolithography applications of perfluorooctyl sulfonate (PFOS) chemicals in semiconductor manufacturing. Very small amounts of PFOS compounds are critical ingredients in leading edge photoresists and antireflective coatings, materials used in the photolithographic process for imprinting circuitry on silicon wafers. Under the agreement, members of the WSC and SEMI committed to ending non-critical uses of PFOS and to working to identify substitutes for PFOS in all critical uses. At the May 2008 WSC meeting the WSC and SEMI first reported on the progress of the industry towards its voluntary goals, this statement provide a further update to that information.

PFOS continues to perform an important role in semiconductor manufacturing. Photoresists (resists) and antireflective coatings (ARCs) are used to form the patterns that are then transferred into the semiconductor chip to form the tens of millions of capacitors, resistors, and transistors that make up a single integrated circuit. While PFOS remains a critical component of these resists and ARC's the industry has been able to gradually reduce or eliminate PFOS in non-critical uses.

Some of the replacements for PFOS which have been found and implemented in current manufacturing have come from shorter-chain perfluoroalkyl sulfonates (PFAS) class of chemicals. PFAS has been utilized in this area as a replacement material due to the functionality of its chemical properties.

The WSC is pleased to provide this final report of our progress to the voluntary commitment.

- All countries/regions confirmed they dispose of solvent waste containing PFOS using incineration by December 2006 as outlined in the voluntary agreement. These waste management practices insure the highest level of treatment and destruction to reduce the quantity of PFOS that may be released to the environment.

- WSC and SEMI successfully engaged in a worldwide PFOS data collection effort to set a 2005 baseline. The WSC and SEMI also continued to collect 2007 PFOS data. The attached 2007 PFOS mass balance is based on expert knowledge of current manufacturing processes, equipment design and operations. It reflects conservative assumptions and may overestimate releases of PFOS to the environment. The industry confirmed implementation of phase out plans for non-critical uses, with virtually all non-critical uses eliminated in 2007

- The WSC undertook a comprehensive survey and evaluation of potential wastewater discharge control technologies (a list of references can be found in Attachment 2) are attached). Researchers have evaluated various methods to remove or destroy PFOS in wastewaters. Some of the tests showed promising results in a small, bench scale laboratory environment. However, the current performance and economic viability of the treatment technology is not appropriate for semiconductor manufacturing. Additionally, no new technology has emerged at this time which demonstrates technological feasibility, treatment effectiveness and economic viability. Furthermore, while incineration is an effective treatment method for solvent waste it is generally considered to be an inefficient use of energy for low PFOS concentration, high volume wastewater from the industry.

- WSC and SEMI members have undertaken significant research and development activities in an attempt to work towards PFOS substitution. The elimination of PFOS in non-critical uses is one example of success in this area. However, the unique chemical properties of PFOS used in all critical uses (i.e. photolithography) prevent a comprehensive substitution for all PFOS utilized in critical uses. The industry will continue to work towards developing comprehensive PFOS substitutes for current and future semiconductor manufacturing.

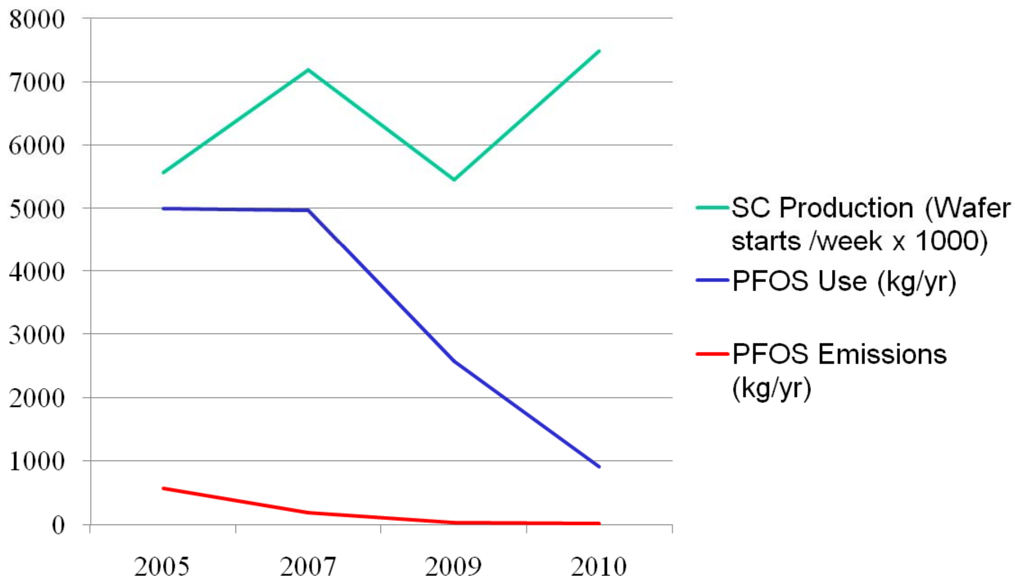
- The Semiconductor Industry Association in China joined the WSC organization in 2008. Their assessment of the use of PFOS in semiconductor manufacturing in China revealed that uses were comparable with those of Semiconductor Industry Association's in the other regions. Semiconductor Industry Association in China agreed to meet the terms of the voluntary agreement.

- The WSC and SEMI recognise the decision of the Conference of the Parties to the UN Stockholm Convention on persistent organic pollutants, at their fourth meeting held in Geneva from 4 to 8 May 2009, to adopt an amendment to Annex B to add PFOS. We acknowledge the continued need for PFOS use in critical uses in the industry as outlined in the decision to grant semiconductor uses exemptions.

- From discussions with our suppliers we know that the manufacturers who synthesize and supply PFOS to the photolithography chemical suppliers have terminated production of these PFOS materials. The WSC SC manufacturers have agreed not to seek new uses of photolithography chemicals containing PFOS and the suppliers have publically stated that they will not provide PFOS-containing chemicals for any new uses. Additionally, semiconductor companies are replacing remaining use of PFOS as the feasibility and capability are proven. A few semiconductor companies will be required to continue to use PFOS blends until these feasibility issues are overcome. The amount left in use is highly controlled.

- Over the last several years semiconductor manufacturers and suppliers have successfully reduced PFOS use significantly. Non-critical uses have been virtually eliminated and critical uses have decreased sharply within the semiconductor industry. While very small amounts are estimated to be released, the result of this work is that PFOS use and emissions levels are now environmentally insignificant and there are no possibilities for increased use. As of May 2011, the WSC members have reduced global emissions of PFOS from semiconductor use to approximately 6kg/year which represents a 99% reduction from semiconductor emissions in 2005. These emissions will continue to reduce as technology and feasibility permit replacement of critical uses. The WSC remains committed to responsible environmental stewardship and will now focus on other important global chemical issues.

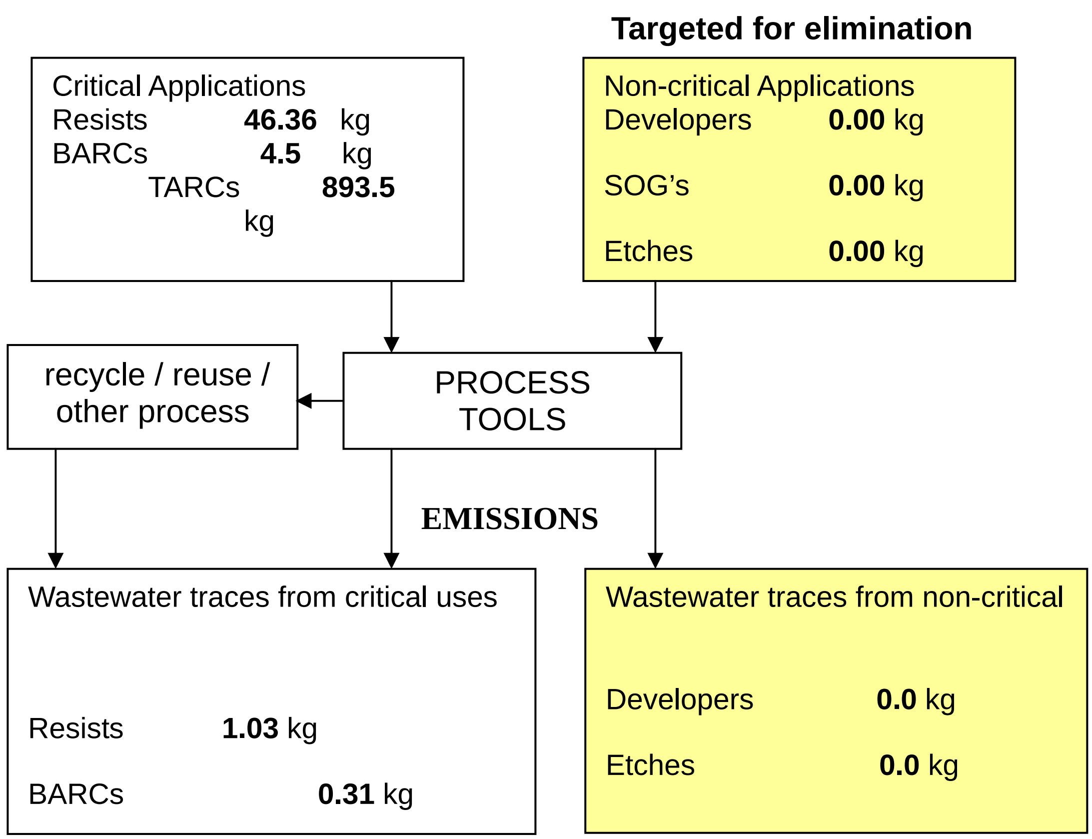
PFOS Trends



8000
7000
6000
5000
4000
3000
2000
1000
0
2005
2007
2009
2010
SC Production (Wafer starts /week x 1000)
PFOS Use (kg/yr)
PFOS Emissions (kg/yr)

PFOS Mass Balance

WSC 2010 Data



1. The mass balance is based on expert knowledge of current manufacturing processes, equipment design and operations.

2. The quality of the source data and calculations is improved when new information becomes known.

3. It reflects conservative assumptions and may overestimate releases of PFOS to the environment.

4. A few manufacturing materials containing PFOS may be recycled or reused in other manufacturing processes before disposal to incineration.

Attachment to Annex 2: **PFOS Research and Development References [as integral part of the PFOS Agreement]**

Followings are Research and Development papers related to PFOSs reduction issued until last year.

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[2] Appendix III, Semiconductor Photolithography Mass Balance Narrative, EPA docket control number OPPTS 50639.

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