

Impacts and Insights

**2016 Progress report - year one IT industry sustainability
impacts of the new generation TCO Certified**



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Driving progress toward a sustainable IT product life cycle

TCO Certified is the world's most comprehensive sustainability certification for IT products, helping organizations make responsible product choices.

For 25 years we have provided solutions for reducing risk and meeting sustainability challenges connected to electronics.

TCO Certified includes life cycle criteria for environmental and social responsibility and is a Type 1 Ecolabel in accordance with ISO 14024.

Independent verification of product, factory and brand owner compliance, both pre and post certification, is included in TCO Certified.



About this report

Through independent certification, community engagement and industry insight, TCO Certified has continued to drive sustainability improvements in the IT industry in 2016. As part of our regular three year criteria development cycle, measuring the impact of TCO Certified is an important step in this process.

This progress report outlines some key findings from year one of the new generation TCO Certified, launched at the end of 2015. Findings are based on post certification verification rounds carried out during 2016, to assess IT product, factory and brand compliance with criteria for environmental and social responsibility.

A case study compares 2013-2016 outcomes in socially responsible manufacturing practices in tier one factories making certified product models for 16 brand owners; Acer, AOC, ASUS, BenQ, Dell, EIZO, Fujitsu, Hanns.G, HP, iiyama, Lenovo, LG, NEC, Philips, TERRA and ViewSonic. Conclusions show measurable brand owner improvement in code of conduct compliance and corrective actions, while excessive working hours is a continuing problem.

Other impacts include greater brand owner engagement in initiatives in conflict minerals and a paradigm shift in identifying safer flame retardant chemicals for use in certified products.

Through our annual brand owner reviews, we have also seen growth in industry's commitment to sustainability initiatives, even beyond the scope of TCO Certified.

For the purposes of this report, the term "brand owner" refers to the companies owning the brand names under which TCO Certified products are sold.

TCO Certified is a product certification. Compliance applies to specific product models and the manufacturing facilities where they are made. While responsibility for compliance is placed on the brand owner, TCO Certified does not indicate certification or compliance of the brand as a whole.

A word from our CEO

»Collaborating
for next level
impacts«



As engagement in sustainability issues grows, TCO Certified continues the drive toward IT products that are more environmentally and socially sustainable. Through independent certification, community engagement and insight, TCO Certified provides purchasers and industry worldwide with a verified way to make more responsible choices.

In 2016 we marked a number of firsts. A new generation TCO Certified was in place, introducing criteria for conflict minerals and safer flame retardant chemicals, while increasing brand owner responsibility for socially responsible manufacturing. Through our verification rounds, we also developed a new model for more effective corrective actions in working conditions in manufacturing. We also continued our regular reviews of brand owner proactive work and engaged with stakeholders in sharing best practices and strategic approaches to solving sustainability challenges.

Some highlights from 2016:

- A new generation TCO Certified in place
- 27 brand owners offering certified products
- Improvements in working conditions where certified products are made
- A public list of accepted chemical substances, representing a paradigm shift in the reduction and substitution of hazardous chemicals
- Greater sustainability commitments from purchasers
- Inaugural Sustainable IT Summit and webinar series

This progress report highlights some important findings from our most recent product and factory post certification verification rounds and annual reviews with brand owners. Through this process we've observed measurable progress in supply chain responsibility and improvements in code of conduct compliance, while challenges persist in working hours, something that will demand our continued attention.

A world where IT products have a sustainable life cycle is an ambitious vision and there are a lot of issues that need to be addressed. Together, we will need to re-dedicate ourselves to continued improvement in reducing social and environmental problems.

Join us in this important mission. As a purchaser, your use of TCO Certified when choosing computers, displays and other IT products has a direct effect on industry's progress. For brand owners, certifying your products is independent proof of your commitment to a more sustainable, responsible product life cycle.

Our next generation TCO Certified is targeted for release in 2018 and will lead worldwide progress toward this goal. We welcome our continued work together to make IT products more sustainable for everyone.

Sören Enholm

CEO, TCO Development

Summary

Improvements and remaining challenges

2016 was year one of the new generation TCO Certified, resulting in greater IT brand owner action to improve socially responsible manufacturing, commitment to conflict minerals initiatives and a new approach to choosing safer chemicals.

Through working with our stakeholders in purchasing, industry and sustainability, we have also continued to build a community focused on the common goal of driving a more sustainable product life cycle for IT products.

Some key impacts included in this report

- based on our 2016 post certification verification rounds:

A. Socially responsible manufacturing

Greater brand owner responsibility, resulting in improved code of conduct compliance

Case study of 16 brand owners compares 2013-2016 data on compliance with code of conduct.

Brand owners included in the case study: Acer, AOC, ASUS, BenQ, Dell, EIZO, Fujitsu, Hanns.G. HP, iiyama, Lenovo, LG, NEC, Philips, TERRA and ViewSonic.

Major findings include:

- Measurable improvements in socially responsible manufacturing where TCO Certified products are made
- Reduction from 16 brand owners in 2013 to 2 in 2016 showing code of conduct violations. Remaining two brand owners showed health and safety nonconformities, which have since been remediated
- Compliance with labor law provisions, particularly working hours, is still a persistent problem industry-wide, despite some measurable improvement among certifying brand owners
- Improved engagement in conflict minerals initiatives

B. Hazardous chemicals

A paradigm shift in hazardous chemicals

Moving from chemicals with unknown human health and environmental effects, to safer chemicals where these effects are known.

- Only flame retardant chemicals that have been independently assessed and benchmarked as safer alternatives are used in certified products
- Increased transparency through a public list of safer, accepted flame retardant chemicals

C. IT industry's proactive work

Insights into broader proactive engagement in social responsibility initiatives

We have observed:

- Improved engagement in systems for handling corruption and worker grievances, along with greater supply chain sustainability
- Further investigation needed in preventing nonconformities in working conditions and better knowledge of supply chain



ABOUT TCO CERTIFIED.

About TCO Certified

Sustainability throughout the product life cycle

TCO Certified is the world's most comprehensive sustainability certification for IT products, helping organizations make responsible product choices.

For 25 years we have provided solutions for reducing risk and meeting sustainability challenges connected to electronics.

TCO Certified includes life cycle criteria for environmental and social responsibility and is a Type 1 Ecolabel in accordance with ISO 14024. Independent verification of product, factory and brand owner compliance, both pre and post certification, is included in TCO Certified.

Available for displays, notebooks, smartphones, tablets, all-in-one PCs, desktops, projectors and headsets.



Criteria summary

Electronics are associated with many sustainability risks throughout the life cycle, such as working conditions in manufacturing, negative environmental effects, energy consumption, hazardous substances, usability and e-waste.

TCO Certified contains criteria aimed at addressing many of these challenges.



Socially responsible manufacturing

Code of Conduct, independent factory audits, brand owner initiatives, conflict minerals

Environmental Management System

ISO 14001 or EMAS registered. Independent measure of environmental improvements



Climate / energy efficiency

Energy Star (where applicable). Energy efficiency of product and power supply

Ergonomic design

Visual quality (for display products) ergonomic design, usability

Health, safety, emissions

Acoustic noise protection, low emissions, electrical safety

Extended product life

Product warranties, availability of replacement parts



Hazardous substances in product and packaging

Limits on phthalates, halogens, assessment of non-halogenated flame retardants

Product and packaging designed for recycling

Coding of plastics, limits on number of different plastics, all packaging recyclable

Product take back

Brand owner offers product take back at end of life

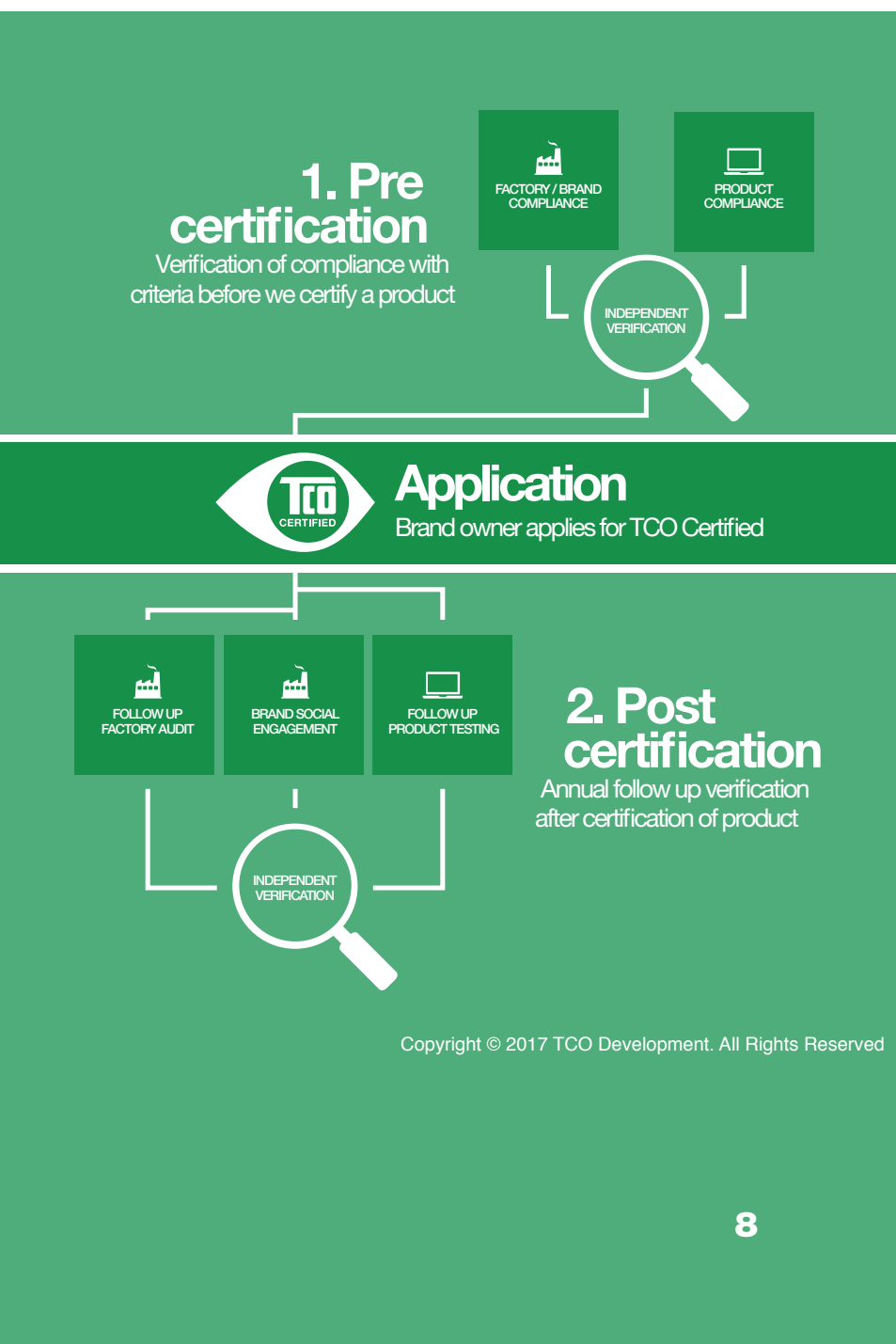
Independent verification in TCO Certified

Independent verification is a cornerstone of TCO Certified. Assessment of product, factory, and brand owner compliance takes place both pre and post certification.

Confirming compliance with TCO Certified is vital for ensuring trust among the purchasers and brand owners that use it. The process also provides direct access to industry conditions and insights, allowing us to measure progress and identify hot spots that demand our continued attention.

All testing and verification in TCO Certified is carried out by independent test and verification partner organizations, typically world-renown test houses that specialize in electronics, social responsibility or sustainability issues.

Accuracy and
reassurance
through
independent
verification



All organizations verifying for TCO Certified are independently accredited in accordance with ISO/IEC 17025.

All detected nonconformities in TCO Certified products must be corrected through a corrective action plan within a reasonable time frame, which is determined based on severity and complexity of the problem. This is one of the most important aspects when driving improvements in the IT industry.

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Verification rounds, 2016

In 2016 we carried out a number of follow up verification and quality assurance activities, including:

1. Post certification verification - products, factories and brand owner responsibility

As part of our annual product follow up program, we have retested a selection of certified product models. Testing includes analysis of chemical content and ergonomic aspects such as display luminance and color performance, along with other factors. Products are typically selected based on various risk factors, for example products with an extended certificate life or where several variations of a display panel have been used. Products are also selected to represent a wide range of brands.

As the number of manufacturing sites entering the TCO Certified program grows, so does our compliance monitoring of factories manufacturing certified products. During 2016 we carried out a number of follow up factory audits.

2. Review of TCO Certified system

We have conducted an internal review of all processes and routines in TCO Certified, to ensure consistency and accuracy in accordance with the requirements for ISO 14024 Type 1 Ecolabels. TCO Certified has also met the requirements for the Global Ecolabelling Network's GENICES peer review accreditation, in accordance with ISO 14024.

More information at:

www.globalecolabelling.net/gen-members/genices/

3. Review of brand owner proactive work

A detailed review with a brand owner representative, who is designated as responsible for socially responsible manufacturing. The review focuses on the company's proactive work in socially responsible manufacturing and actions taken to prevent future nonconformities. The review is designed to show where strengths and weaknesses exist and is aimed at continuous improvement at each review. In 2016 we carried out the review with 19 brand owners.

4. Review of verification partners

With multiple accredited test and verification partners, each site must deliver accurate, repeatable results, regardless of location. During 2016 we carried out our regular 'round robin' product testing, where a single product sample is tested at all test sites. The purpose is to ensure consistency of test methods, equipment calibration and criteria interpretation.

Every test and verification site is also subject to annual accreditation in accordance with the International Laboratory Accreditation Cooperation (ILAC), the international organization for accreditation of conformity assessment bodies including calibration laboratories (using ISO/IEC 17025)

5. Brand claims monitoring

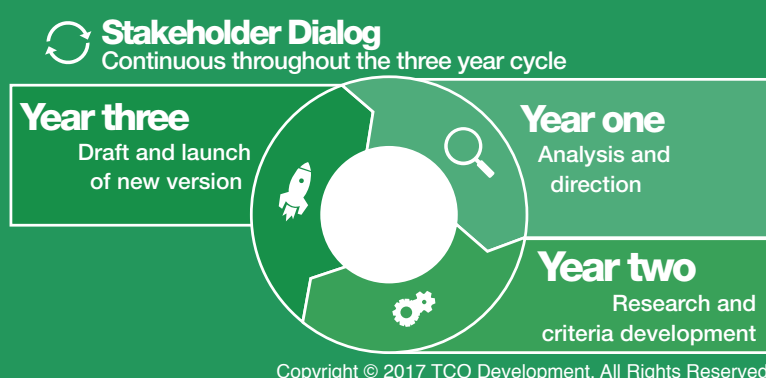
We have continued our ongoing efforts to ensure continued accuracy in any product claims related to TCO Certified. Brand owner websites and promotional materials are regularly reviewed and corrected for this purpose.

A new generation TCO Certified

A new generation TCO Certified is launched every three years, with the latest generation in November 2015. This rapid development cycle allows us to design progressive criteria that are in line with current technologies and that can drive faster progress in targeted areas.

Throughout the process, we invite input from an international group of stakeholders and interested parties, representing brand owners, manufacturers, purchasers, technical and scientific experts, NGOs and interest groups.

TCO Certified criteria development cycle



Focus criteria in the new generation

Socially responsible manufacturing

Expanded brand owner responsibility for supply chain working conditions and implementation of corrective actions.

Brand owners bear the ultimate responsibility for social responsibility in the supply chain and new criteria expand this responsibility to focus on improved closure of corrective actions and further implementation of the code of conduct in the supply chain. The goal is to drive improvements in the brand owner's structured work, close nonconformities and minimize the risk of future violations.

Brand owner commitment to conflict minerals initiatives

Brand owners must prove their involvement in programs aimed at establishing a conflict-free supply chain of Tantalum, Tin, Tungsten and Gold (3T+G). This includes supporting in-region responsible sourcing programs or implementing an OECD due diligence process. This helps suppliers meet due diligence requirements, and develop a legitimate mining industry that directly benefits the people whose livelihoods depend on it.

Reduction of hazardous chemicals

A new paradigm for identifying safer flame retardants

While toxic halogens are largely phased out of certified products, too little is known about the non-halogenated chemical flame retardants used to replace them. TCO Certified has added criteria aimed at increasing transparency around these chemicals; eliminating the most hazardous, identifying safer alternatives and making this information public. This assessment is carried out using the GreenScreen® for Safer Chemicals hazard assessment tool. The chemicals approved for use in TCO Certified products are published in the TCO Certified Accepted Substance List, available at www.tcodevelopment.com. The list represents a shift from the traditional approach of listing banned substances only.



COMMUNITY.

Building a community of best practice

Progress is best made when there's open and constructive stakeholder dialog, aimed at more transparency and achieving common objectives. IT purchasers are increasingly aware of the social and environmental risks associated with electronics. Using TCO Certified helps support responsible purchasing decisions and verification of product compliance.

Brand owners turn to TCO Certified for independent validation of their product attributes and sustainability progress, making it easier to secure buyer trust. As an independent organization, we are uniquely positioned to offer buyers, brand owners and experts a platform for exchanging knowledge and best practice. This progressive dialog is vital for developing mutually beneficial solutions.

Community engagement highlights, 2016

Sustainable IT Summit

Inaugural TCO Development Sustainable IT Summit. Held to mark the launch of the latest generation TCO Certified, the Summit brought together leading voices from industry and purchasing communities to share best practices and discuss strategic approaches for higher impact.

Webinar series

2016 Sustainable IT Webinar Series – a learning platform for sharing the latest research and initiatives from brand owners, research experts and purchasing leaders. Continuing in 2017.

Dialog with brand owners

Annual review with brand owners. As an extension of the certification process, we carry out an annual dialog with each brand owner about their proactive work to further their commitment to environmental and social responsibility.



Stakeholders have direct impact

Purchasers

Reducing risk, impacting industry

Purchaser use of TCO Certified is critical to driving positive change, including at the factory level. Through their continued use of TCO Certified as part of a sustainable purchasing program, organizations around the world have been able to reduce their environmental and social risks when buying IT products and send a clear message to industry.

Benefits to IT buyers include:

- Easier to make more responsible IT product choices
- Independent verification is included - no need to do it yourself
- Easier to reduce the social and environmental risks of IT products

Your purchasing choices drive change - by using TCO Certified you have a direct impact on sustainability in the IT industry, including socially responsible manufacturing.

Using TCO
Certified is part of
a comprehensive
sustainable IT strategy

Brand owners

Certified product models from 27 brand owners

Certifying product models makes it easier for brand owners to meet buyer demand, gain access to volume contracts and show compliance with current, relevant sustainability criteria. They also benefit from the structured platform for continuous improvement that TCO Certified offers. Progressive criteria and independent verification help brand owners reduce sustainability risk and provide validation of progress and product claims.

Brand owners offering TCO Certified products, 2016

Acer, AOC, ASUS, BenQ, Casio, Casper, Dell, EIZO, Founder, Fujicom, Fujitsu, Genuine, Hanns.G, HP, iiyama, Jabra, Lenovo, LG, MEDION, MSI, NEC, Philips, Plantronics, Samsung, TERRA, VERSUS, ViewSonic

Strategic partners

Collaborating for greater impact

Continual progress demands constant innovation. Working with our network of strategic partners is key to our ability to drive meaningful change and provide decision support for purchasers and industry alike. This means being at the forefront of technical innovation and setting relevant criteria aimed at solving the most pressing social and environmental challenges.

Among our collaborations in 2016:

- Continued partnership with accredited test and verification organizations TUV Rheinland, Nemko, Intertek, Goodpoint and Swerea IVF
- Integration of the Clean Production Action's GreenScreen® for Safer Chemicals hazard assessment tool in TCO Certified
- Sustainable Purchasing Leadership Council - IT Hardware Technical Advisory Group
- ModUpp2020 - Sweden-based sustainable purchasing education initiative
- Multi-stakeholder collaboration in sustainability, purchasing, legislative and voluntary initiatives, NGOs and interest organizations



IMPACTS.

IMPACTS, A

Socially Responsible Manufacturing

Impacts, 2016

- Improved code of conduct compliance and implementation of corrective actions, especially when brand owners present collective demands to shared manufacturing sites
- Persistent challenges in adherence to labor laws, despite some progress
- Greater brand owner engagement in conflict-minerals initiatives

Impacts, A.1

Brand owner improvements in factory working conditions

In the new generation TCO Certified we have increased brand owner responsibility for code of conduct compliance and implementation, as well as follow up of corrective actions in factories where certified products are made.

As shown in our 2016 case study of 16 brand owners, code of conduct compliance has improved, along with closure of corrective actions, despite some persistent challenges.

A shift to greater brand owner responsibility for the supply chain

Beginning in 2009, TCO Certified has included criteria for socially responsible manufacturing. What started with brand declarations of social responsibility initiatives, the criteria has evolved into a structure for greater transparency and continuous improvement in supply chain working conditions.

Prior to the 2012 generation, brand owners typically placed responsibility for working conditions and corrective actions onto manufacturing partners. The new generation shifts this responsibility to the brand owners. There are several reasons for this change:

- Manufacturer improvements are most often at the demand of the customer, in this case the brand owner. For a manufacturing supplier, social responsibility is not always a priority and may be outweighed by lead time, cost and other factors
- Brand owners have the most influence and opportunity to affect working conditions in the supply chain
- Purchasing organizations generally consider brand owners as having ultimate responsibility for supply chain working conditions
- While brand owner responsibility has been a key aspect in TCO Certified since 2012, we have observed that a single brand acting alone may not have enough leverage to drive effective change at the factory level. In 2016 we have tested a new approach, based on collective demand-setting from several brand owners at shared manufacturing sites. This new method has resulted in faster, more effective implementation of corrective actions

There are however remaining challenges where nonconformities are still common, particularly in adherence to local labor laws. While there has been some measurable improvement, these issues are continuing hot spots moving forward.

An observation is that brand owners and their manufacturing partners have a greater awareness of their social responsibility compared with our 2013 analysis, and while there are persistent hot spots, the level of overall engagement and preparedness has improved.

TCO Certified criteria summary - socially responsible manufacturing

Brand owner must implement a code of conduct, complying with:

- Eight ILO Core conventions
- UN Convention on the Rights of the Child, article 32
- Health & Safety and labor laws in the country of manufacture

To prove compliance, brand owners must:

- Sign a legally binding license agreement with TCO Development
- Have a serious code of conduct and ensure it is communicated and implemented in the supply chain
- Regularly conduct audits of all factories manufacturing certified products and send samples of these reports to TCO Development for review
- Handle nonconformities in the whole supply chain in a responsible way, in accordance with corrective action plans
- Appoint a person responsible for implementation of the code of conduct and for reporting to TCO Development annually
- Report proactive work annually, aimed at minimizing risk of nonconformities against the code of conduct

Criteria in TCO Certified for conflict minerals; Brand owners shall:

- Publish a conflict minerals policy
- Commit to in-region initiatives or establish a due diligence process for conflict minerals

Case study; tracking brand owner factory progress, 2013-2016

Improved working conditions, but challenges with labor laws

In 2016 we studied progress in socially responsible manufacturing at tier one sites manufacturing TCO Certified products for 16 brand owners. This case study is based on follow up verification with the same facilities assessed in 2013 and included in our report "The State of Socially Responsible Manufacturing in the IT Industry" (2014).

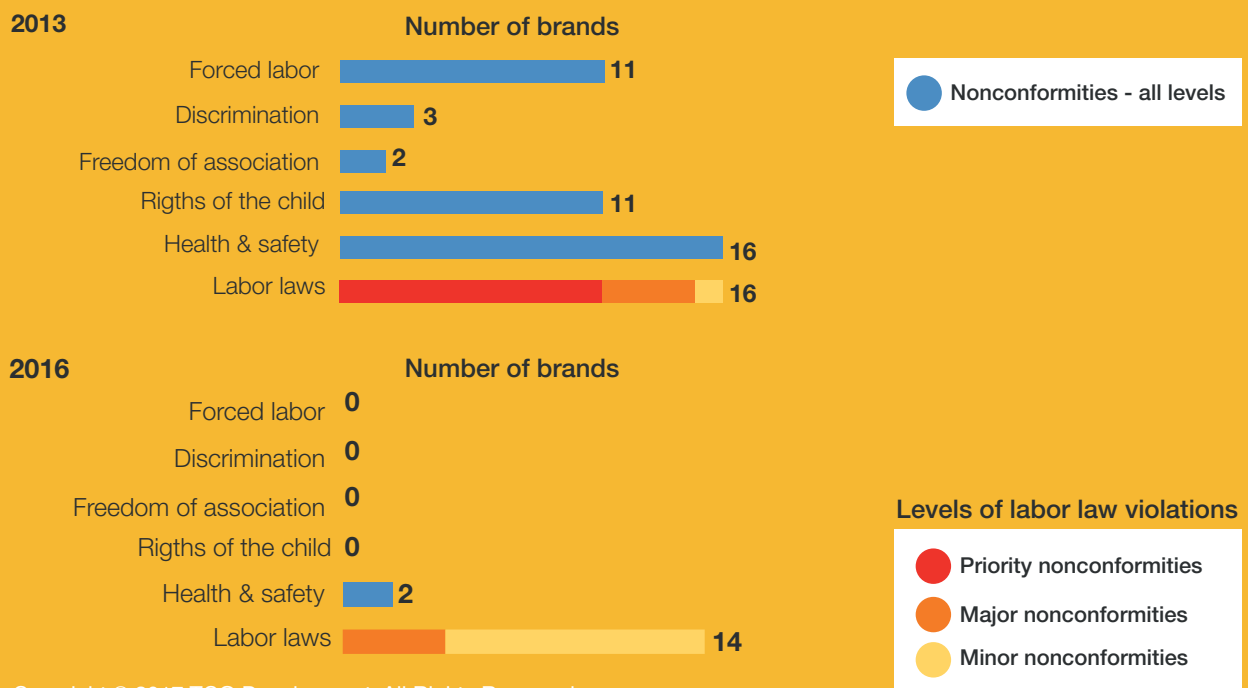
One brand owner could not be included in this study as they are no longer using the same manufacturing facility as in 2013, and therefore could not provide comparative data. That brand owner's new facility is however subject to the same compliance and follow up requirements.

The comparison is based on collected data from both 2013 and 2016, tracking progress of the same brand owners and factories, including results from third party audits. Verified audit reports show major improvement in code of conduct compliance and closure in all but two areas of corrective action by the end of 2016.

Of note is that factory audits do also show some challenges in effective assessment of freedom of association.

However, adherence to labor laws is a continuing challenge, as violations continue, despite some measurable improvement.

Number of brands with nonconformities in factories manufacturing TCO Certified products, 2013-2016.



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Labor laws - a measurable shift, but challenges persist

Despite some progress, labor law nonconformities persist. These violations are most commonly connected with payment of wages as well as excessive factory working hours.

In our 2016 study, 14 of 16 brand owners showed some level of nonconformity with labor law provisions, in factories manufacturing certified products.

However, our observations reveal some improvement. Where 11 brand owners in our 2013 analysis showed labor law violations at the highest “priority” level. The number of priority violations was reduced to zero in 2016.

While the majority of brand owners still show some kind of labor law nonconformity in the factories, the severity of those violations has been reduced to either the “major” or “minor” levels.

Important to note are the different characteristics of labor law compliance when compared with other code of conduct aspects such as compliance with ILO and UN conventions. It is clear that progress in this area is more difficult and longer term as it involves legislative and public policy issues at the local level.

Labor law is a complex issue, involving challenges not only with working hours, but also with migrant workers, the employment of students and temporary workers, among other issues.

Labor law and non conformities

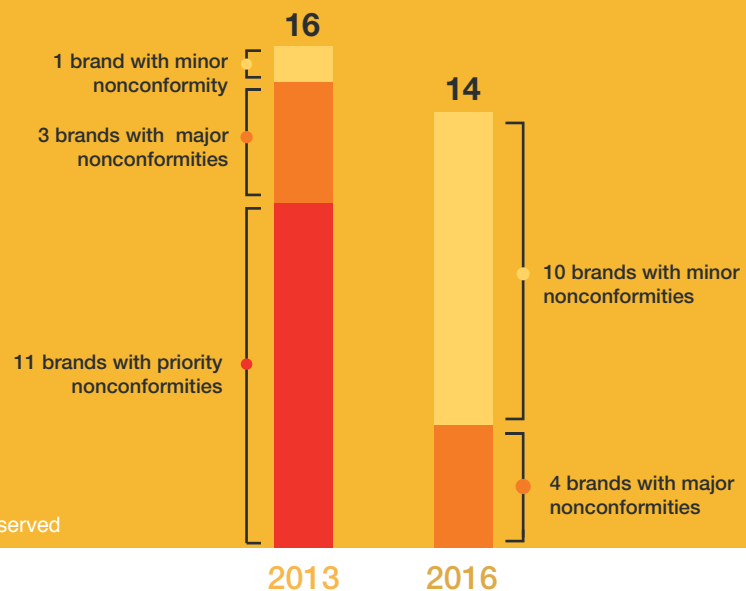
The most commonly observed labor law nonconformities in our follow up verification are:

Working hours

- Excessive overtime
- Child labor - juvenile workers doing night shifts
- High percentage of temp workers

Wages

- Payment



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Working hours - a unique and complex challenge

Overtime hours is a widespread and complex challenge in electronics manufacturing and one that is difficult to solve. A major obstacle is a lack of labor law enforcement by local governments. As a result, many companies follow the actions of their competitors and violate the law in order to remain competitive.

For example, one such local law caps permitted overtime at nine hours a week, resulting in a maximum 49 hour work week. Migrant workers on time limited contracts make up a large proportion of the workforce at some factories and in order to save money, they often seek overtime hours in excess of these limits, including working at least one weekend day per week.

Overtime pay is much higher than the normal pay so these hours can make a big impact, with up to half of the salary consisting of overtime payments. Sometimes when companies refuse to allow more than the legal limit of overtime, workers move to another or additional employer to make up the desired extra hours.

While a complex situation, efforts moving forward should prioritize that workers do not push the limit of their physical and mental health and that they are correctly compensated for overtime work.

Impacts, A.2

Brand owner collaboration drives faster factory improvements

There are several approaches aimed at driving improvements in supply chain working conditions. Some are more effective than others and progress depends on a number of success factors. TCO Certified holds brand owners accountable for code of conduct implementation in the supply chain, providing independent verification of compliance and clear consequences for noncompliance.

During 2016, we tested a new approach to driving even faster factory improvements, by coordinating a number of brand owners to collectively communicate their demand for improvement at shared manufacturing sites.

TCO Certified approach to factory improvements - brand owner responsibility, accountability and follow up.

Traditionally, common approaches have required manufacturers or brand owners to have a code of conduct in place, but not to back it up with independent factory audits or mandatory closure of corrective actions. While well intentioned, these initiatives often lack the independent verification and follow up required to ensure that improvements actually take place.

Even in cases where audits are required, improvements are less likely if brand owners are not held accountable for remediating the corrective actions identified in the audit process.

In the electronics supply chain, the brand owner has complete oversight and control, making them uniquely positioned to drive positive change among manufacturing partners. In TCO Certified, this requires brand owner accountability in a number of aspects. See figure "Success factors for factory improvements" below.

Success factors for factory improvements

Brand owners must be responsible and held accountable for:



Code of conduct addressing factory working conditions



Implementing code of conduct in the supply chain



Independent audits of factories in the supply chain



Corrective action plan for handling nonconformities



Following up the implementation of corrective actions

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In meeting these success factors, the brand owner must be held accountable to an independent party-in this case TCO Certified - that can verify compliance and implement consequences for noncompliance. In TCO Certified, this means the risk of losing the product certificate.

2016 - testing a new strategy for more effective factory improvements

Even with brand owner responsibility and correct follow up in place, incentives for factories to improve can depend on the size and influence of the brand owner demanding the corrections. We have seen that a single brand owner acting alone may not have the necessary leverage to influence a larger manufacturer.

With this in mind, we began testing a new strategy in 2016, working with a group of brand owners to exert collective pressure on factories to correct nonconformities. Results from 2016 show that this approach leads to faster corrective actions.

For example, compliance at two large sites manufacturing TCO Certified products for 12 brand owners was followed up during 2016. The results showed inadequate progress on closing nonconformities that were identified in an earlier independent audit. This is despite individual follow up compliance requests from several brand owners. To drive faster closure of these nonconformities, TCO Development coordinated a group of affected brand owners to place collective demand on the shared suppliers. The result was faster action by the manufacturers to close remaining nonconformities within a set time frame.

This collective approach has been particularly effective at driving progress among large suppliers that typically serve several brand owners. When working with a large manufacturing partner, each brand owner individually may represent too small a percentage of the total spend to have enough influence. Working together, brand owners can more effectively show the necessary total leverage to drive more rapid action.

Another case in 2016 involved two brand owners, where the independent verification body had given a “non-effective” rating on over 50% of their corrective actions. We set up a collaboration project between the brand owners, the factory and the auditor to work out an action plan for these nonconformities. The result was a much improved corrective action plan that received a 100% effective rating.

Responsibility for entire factory is important

To comply with TCO Certified, the brand owner is required to take responsibility for conditions in the entire factory, not just their own production lines within the facility.

In the case of larger, diversified manufacturing plants, compliance with TCO Certified applies to the facility with the business license to manufacture certified products.

In addition to the independently verified audit for the whole factory, each brand owner is assessed on their proactive work in social responsibility, as well as their ability to implement those practices in the supply chain and close corrective actions. It is our firm belief that results are more credible when the factory as a whole is taken into account, and not only production lines covering a single brand owner, as is common practice.

Impacts, A.3

Greater commitment to conflict minerals initiatives

The new generation TCO Certified introduced initial criteria for brand owners to declare their commitment to reducing their use of minerals from conflict-affected or high-risk areas.

As with most new focus areas in TCO Certified, this initial requirement aims to define a baseline level by assessing current brand owner engagement and is designed with a view to further developing this criterion for greater impact in future generations.

Tin, tantalum, tungsten and gold – commonly known as “3T+G” minerals are used in various capacitor and electronic components as well as in solder for printed circuit boards. They are also connected with widespread environmental and human rights abuses in regions of the world where they are extracted. Forced and child labor is common, as are fundamental human rights abuses, violence and corruption.

There are several international and in-region initiatives aimed at establishing conflict-free sourcing of these minerals, especially from the Democratic Republic of Congo.

Several brand owners consulted with us for advice on how to meet the requirements to publish a policy on conflict minerals and commit to in-region initiatives. As a result, more brand owners have committed to initiatives in conflict minerals, and a greater number have implemented the ambitious OECD Due Diligence Guidance for Responsible Supply Chain of Conflict – Affected or High-Risk Areas.

The diagram below shows the progress made since the introduction of conflict minerals criteria in TCO Certified. Data is based on information from 27 brand owners certifying products to either the previous or current generation. Compliance with conflict minerals criteria applies to the current generation, and at the time of writing, 19 brand owners offer products certified to the new generation. Note that some brand owners are still in the process of upgrading to the latest generation.

Brand owner progress on conflict minerals, 2014-2016

19 of 27 brand owners have certified products to the new generation of TCO Certified



Published conflict mineral policy

17

2014

22

2016

of 27 brand owners published a conflict mineral policy

Mandatory for the new generation of TCO Certified



Supporting in-region conflict-free sourcing initiative

11

2014

19

2016

of 27 brand owners support in-region conflict-free sourcing initiatives

Required for brand owners that do not have an OECD-based due diligence process



OECD-based Due Diligence process

8

2014

18

2016

of 27 brand owners have an OECD-based due diligence process

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Notes:

- Statistics are based on a total of 27 brand owners with certified products in 2014-2016
- In 2016, 5 brand owners had not yet published a conflict minerals policy, and therefore are not compliant with the current generation TCO Certified. Three of these brand owners are in the process of upgrading to the current generation
- In 2016, of the 19 brand owners that have products certified to the latest generation TCO Certified, only one declares that they are yet to implement a due diligence process that is consistent with OECD guidance

IMPACTS, B

Hazardous Chemicals

Impacts, 2016

- Only flame retardant chemicals that have been independently assessed and benchmarked as safer alternatives are used in certified products
- Increased transparency through a public list of safer, accepted flame retardant chemicals

Impacts, B

A paradigm shift in identifying safer chemicals

As toxic halogens have been phased out, too little is known about the non-halogenated chemicals used to replace them.

TCO Certified includes new criteria for replacing the most hazardous non-halogenated flame retardants with safer alternatives.

According to the American Chemical Society, there are currently over 100 million registered chemical substances, with around 15 000 new substances added every day. There is no effective legislation or other regulatory system in place for assessing human health and environmental hazards of chemicals before they are put into use. As a result, potential risk posed by the majority of chemicals in use today is unknown.

The chemical industry largely avoids assessment of their products, as they risk being banned from use if they are found to be hazardous. Lack of industry transparency is also a problem, as formulas, characteristics and applications of the chemicals produced are considered trade secrets.

There is regional legislation in some parts of the world, banning the use of certain hazardous chemicals. One problem with this approach is that those substances are permitted for use until the hazard is proven. In the case of electronics, flame retardant chemicals are added to the plastic in order to meet fire safety requirements. If a flame retardant is banned due to the hazards it presents, it's possible that the substance used to replace it presents similar, or even greater, human health and environmental risk.

In our opinion, this method is not sufficiently scientific. A better approach is to only allow chemicals that have been assessed and proven safer to be included in products and in other instances of human and environmental exposure.

What's needed are incentives for chemical manufacturers to have their products assessed and be able to prove they are safer before they are made commercially available. Our opinion is that a growing public interest in chemical safety outweighs industry's privacy demands, making a shift to safer chemical use a matter of public urgency.

In the new generation TCO Certified we have therefore introduced a new principle for dealing with hazardous chemicals. New criteria require that only chemicals that have been assessed and benchmarked as safer alternatives are approved for use in certified products. This process effectively eliminates the use of all chemicals that have unknown effects to human health and the environment. In the new generation, the criteria apply to flame retardants.

Moving forward, we intend to expand the criteria to other chemicals used in certified products.

The assessment is carried out using the GreenScreen® for Safer Chemicals framework, developed by US-based non-profit Clean Production Action.

Substances are assigned a benchmark between 1-4, with 1 being the most hazardous. Chemicals receiving a benchmark 2-4 are eligible for inclusion in the TCO Certified Accepted Substances List (available at www.tcodevelopment.com) and are approved for use in certified products. The list also contains information to identify the formulas of the chemicals which allows anyone to challenge the assessment of the substance.

For now, the availability of chemicals that reach GreenScreen® benchmarks three and four is limited. Therefore substances that reach benchmark two are accepted. In future generations the ambition is to progress to higher thresholds and a wider range of chemicals, as safer alternatives become more readily available.

»We believe it's time for the IT industry to take a greater responsibility for identifying safer chemical alternatives«

Niclas Rydell, Director, TCO Certified

TCO Certified criteria summary - hazardous chemicals

New criteria for hazardous chemicals - non-halogenated flame retardants

- Non-halogenated flame retardant chemicals used in certified products must be included in the TCO Certified Accepted Substance List
- Accepted chemicals must be assessed and assigned a minimum benchmark 2, according to GreenScreen® for Safer Chemicals

IMPACTS, C

IT Industry's Proactive Work

Impacts, 2016

Insights into:

- **Progress on code of conduct compliance and risk assessment**
- **Brand owners need better knowledge of supply chain beyond second tier**
- **Further investigation required in controlling working hours and increasing brand owner ability to prevent nonconformities**

Impact, C

Proactive work in socially responsible manufacturing

Each year, as part of our review with certifying brand owners, we conduct a dialog about each company's engagement in sustainability initiatives, including proactive work outside the scope of TCO Certified.

The purpose is to have a broader conversation about where industry is heading, possible gaps and opportunities, and areas that may influence future criteria. The review assesses brand owner proactive work, including management systems, policies and processes that better enable them to meet a variety of sustainability objectives.

This dialog is part of a mutual information exchange that contributes to our community of learning and a better understanding of where TCO Certified may be able to support more rapid improvement. Findings from our 2016 reviews show growth in initiatives to assess risk and gain greater control of the supply chain conditions, while there is a clear need for better knowledge of the supply chain itself, along with better brand owner preparedness to prevent nonconformities.

TCO Certified criteria summary - IT industry proactive work

An annual review of brand owner proactive work beyond the scope of TCO Certified provides insights into IT industry efforts in socially responsible manufacturing.

All certifying brand owners are required to nominate a senior management representative, designated to participate in this process.

Positive



19

19 have initiatives for dealing with corruption, embezzlements and extortion



18

18 have systems for confidential handling of factory worker grievances



18

18 have established, or are in the process of establishing, a conflict minerals due diligence process in accordance with OECD guidance



12

12 have published information about their supply chains

Needs improvement



8

Only 8 actively support collective bargaining and free trade unions.



6

Only 6 have knowledge of their supply chain beyond tier two.



7

Only 7 cap the amount of temporary employment at 10%.



Need better brand owner preparedness to prevent nonconformities.



CONCLUSIONS AND MOVING FORWARD.

Conclusions

Progress made and areas for further action

As we have seen, the approach in TCO Certified of independent certification, brand owner responsibility and verification has a positive effect on driving change in the IT industry.

By providing brand owners with a structure for continuous improvement and offering purchasers an independent tool that directly affects conditions on the factory floor, we are beginning to see more progress in social and environmental responsibility.

Along with progress made in code of conduct compliance and corrective actions, problems remain in connection with labor laws. Raising the general baseline of industry responsibility will require continued action in these areas.

Areas for continued improvement will also include deeper commitments to achieving a conflict-free supply chain and even safer chemicals.

Progress made



Fewer code of conduct nonconformities in factories manufacturing TCO Certified products



Paradigm shift in the use of chemicals in products - from a banned list to an approved list



Greater proactive industry engagement in social responsibility, even outside the scope of TCO Certified

Further actions needed



Issues connected to labor laws



Seek more accepted chemicals with a higher benchmark score



Raise the minimum level brand owner commitment to socially responsible manufacturing

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Moving ahead, these conclusions provide valuable input to our work in developing the next generation TCO Certified, due for release in late 2018.

Join us in our drive toward a more environmentally and socially sustainable life cycle for IT products. Your input as a purchaser, brand owner or sustainability expert helps us design relevant, progressive criteria that can make a difference.

Join us as the work continues

Our work toward a more sustainable life cycle for IT products continues.

Reaching this goal will be a collaborative process and we encourage you to join us in this important effort.

Join us, share your expertise and learn from other stakeholders as we develop the next generation TCO Certified.

As a purchaser, your use of TCO Certified when purchasing IT products not only helps you reduce risk, but also drives industry to act more sustainably.

As a brand owner, using TCO Certified provides a structure for continuous improvement and independent validation of your sustainability efforts.

