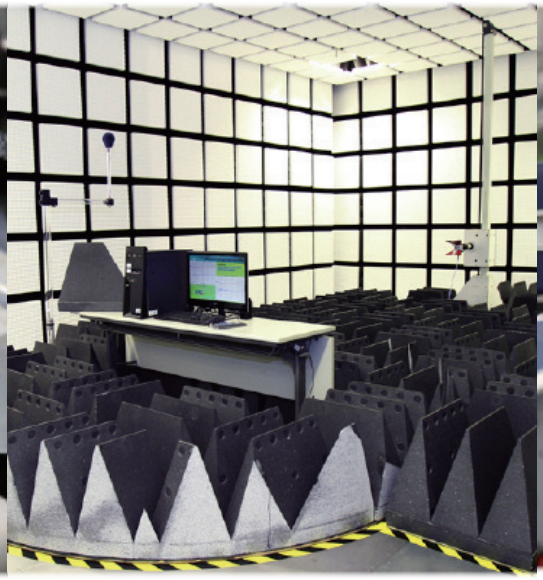




Insights

Study Report on Opportunities for Hong Kong's Testing and Certification Industry

HKPC Hong Kong Productivity Council 香港生產力促進局

Contents

Insights in Brief

A Vibrant Testing and Certification Industry

Testing and Certification (T&C) is an economic area where Hong Kong enjoys clear advantages. With its high level of integrity and credibility, an internationally-recognized accreditation system, high technical competence, and its close geographical proximity to Mainland China, Hong Kong's T&C industry is well-positioned to use its competitive advantages to maximize its promising development potential.

A thriving T&C industry is essential to support Hong Kong's manufacturing and trading industries, and contributes to the development of the city as a business services centre. The T&C industry also plays an integral role in both the local and regional economies.

New Opportunities to Come

To drive the development of the T&C industry, the Hong Kong SAR Government has set up the Hong Kong Council for Testing and Certification (HKCTC). The Council has formulated a market-oriented development plan and selected a number of trades that have good opportunities to promote the use of T&C services.

Given today's rapidly changing global business environment, vigorous development of technology and quickly-evolving standards and regulations, new development opportunities are swiftly opening up for the local T&C industry.

We have observed three mainstream development trends that may generate future T&C opportunities: Smart Technologies, Product Sustainability and Green Transport.

Smart Technologies

Smart technologies are rapidly evolving: five billion "smart" devices with high levels of connectivity are deployed around the world today, with this figure projected to increase to 50 billion by 2020. This vast circulation of smart devices is moving society towards an intelligent, invisible network fabric of items that can be sensed, controlled and programmed.

Presently, Wireless Charging, Near Field Communication (NFC), and Radio-frequency Identification (RFID) are some of the emerging smart technologies which have the potential to become widespread, and for which T&C services will be needed.

T&C can play a vital role in supporting the development of these smart technologies and their application: guaranteeing product safety, facilitating the efficient use of frequency spectrums, and ensuring the proper adoption of new technical specifications and industry requirements.

In light of the positive market outlook for smart technologies, significant development potential exists for the T&C industry of Hong Kong. To further support the local development of T&C services for smart technologies, we recommend further investigating the international regulatory approval T&C requirements relevant to smart technologies; and enhancing the business networking opportunities between local T&C service providers, manufacturers, and major retailers of smart technologies (such as wireless charging products). The T&C industry can also facilitate adoption of certification scheme and the associated test standards to best suit the local NFC and RFID market.

Product Sustainability

With a growing proportion of people leading resource-intensive lifestyles, public demand for natural resources is more intense than ever before. To address the emerging challenge of scarce resources, businesses are introducing products or services that are more sustainable, while sustainability-related product claims and labelling are becoming more prevalent and high profile.

Product Carbon Footprint (PCF) Labelling and the Certification of Biodegradable Materials are among some of the new product labelling trends which will become better-known by consumers, and for which T&C services will be needed.

T&C can play a vital role in allowing consumers to differentiate between products and make truly environmentally-conscious choices, while at the same time underpinning the development of the industry during its journey towards sustainability.

Significant development potential exists for Hong Kong's T&C industry, owing to mounting consumer awareness and corporate support for sustainable products. To accelerate the development of local T&C services for product sustainability, we recommend strengthening the capacity-building efforts of the T&C industry – by enhancing training on product carbon footprint analysis for example; and promoting the business advantages of using product sustainability standards, testing or certification. The T&C industry can also investigate the feasibility of introducing a certification scheme for degradable plastic products.

Green Transport

With the concerns of energy independence and environmental protection becoming prevalent around the world, both the public and private sectors have started to see the need to develop green transportation systems. The HKSAR Government has developed a policy for green vehicles and is encouraging the private sector to take an active role in the development of green transport.

Several areas are potentially significant to the implementation of green transport, namely, EV Batteries, EV Charging Equipment, Fuel Economy and Energy Performance. T&C services will be needed for both of these areas.

The T&C industry in Hong Kong can play a vital role in supporting the development of green transport through assuring a high level of safety, quality and reliability performance of green transport-associated equipment.

Hong Kong enjoys a competitive advantage in developing related T&C services for green transport, due to the support from both national and local government policies, and our strong technical competence and professional integrity. To foster the development of green transport T&C services in Hong Kong, we recommend that the T&C industry look into opportunities to encourage knowledge exchanges with international T&C service providers, and into opportunities to develop local T&C capacity related to green transport.

Empowering Industry Development

Over and above the efforts made by the Hong Kong SAR Government to assist the development of the T&C industry, this study identifies possibilities to further strengthen business development and enhance the professional development of T&C practitioners.

Strengthen T&C Business Development

In Hong Kong, there are a number of testing facilities in research and educational institutions which specialize in various aspects of technical expertise and provide a variety of testing facilities. Currently, there is no single channel that can provide a multitude of testing and technical support services to local industries under one roof. To address this, we recommend building joint expertise among testing facilities of local institutions to further enhance the scope of T&C service capacity and provide a "one-stop shop" solution for the industries.

Currently, T&C business seminars and forums are organized on a regular basis to enable the dissemination of technical information and the exchange of experience. However, the availability of an open platform for exploring new T&C business opportunities between T&C service providers and potential users of various business sectors is limited. Therefore, we recommend extending the business network across sectors and regions by arranging periodic business matching or networking sessions in Hong Kong, as well as exploring opportunities to strengthen business relationships with peers and users on the Mainland, and identifying ways to achieve sustainable growth in the T&C industry in both regions.

To provide new impetus to expand the application of T&C services, we recommend providing both economic incentives and high profile recognition (such as an award scheme). These will directly benefit businesses which actively seek to achieve newly-launched certifications and utilize T&C to gain market competitiveness.

Enhance T&C Professional Development

To suit the evolving need of T&C practitioners to acquire new and advanced T&C knowledge and skills, we recommend raising the profile and maximizing the support of existing training assistance schemes, such as the New Technology Training Scheme (NTTS), among T&C practitioners.

The development of new international standards is also crucial to the industry, as this introduces new solutions to meet the industry's emerging needs. We recommend encouraging practitioners to participate in the development of international

standards through support schemes and exploring the possibility of hosting international seminars and conferences with regard to standardization in Hong Kong.

Currently, various government departments and public bodies organize numerous learning events for T&C practitioners in various locations. In order to provide a centralized knowledge transfer focal point to help practitioners conveniently acquire skills and knowledge, we recommend establishing a one-stop centralized knowledge transfer platform for T&C practitioners to synergize the benefits of knowledge accumulated through different channels and local institutions.

Acknowledgement

Hong Kong Productivity Council would like to thank the following organizations, listed in alphabetical order, for their valuable opinions given in the course of the study:

Bureau Veritas Hong Kong Limited

Centre Testing International (Hong Kong) Co., Limited

Hong Kong Council of Testing and Certification

Hong Kong Plastic Bags Manufacturers' Association

Hong Kong Science & Technology Parks Corporation

Hong Kong Standards and Testing Centre

Intertek Testing Services Hong Kong Limited

SAE International Hong Kong

SGS Hong Kong Limited

The Hong Kong Electronic Industries Association

Chapter 1

Introduction

Objectives of the Study

Given today's rapidly changing global business environment, a new approach to facilitating sustained growth in Hong Kong's T&C sector is needed, in order to strengthen the T&C industry's capability to service the emerging needs of the manufacturing, export and service industries along the entire supply chain. This new approach needs to integrate market intelligence with a holistic strategy for the future development of the local T&C industry, and be geared towards expanding the industry's service capacity to help spur economic development in Hong Kong.

Being an organization which promotes productivity excellence in industry to enhance competitiveness and sustainability, the Hong Kong Productivity Council (HKPC) recently conducted an industry study for the T&C sector with the following objectives:

1. To understand local and global market trends and the associated demand for T&C services;
2. To identify new development opportunities for T&C services which will meet the emerging needs of industries and society as a whole; and
3. To explore initiatives which will empower the sustainable growth of the Hong Kong T&C industry.

Scope of the Report

In this study, we focus on identifying new T&C opportunities that are emerging in response to the latest local and global developments and market trends.

The study recognizes the six selected trades that have been identified by HKCTC as trades that have good opportunities to promote the use of T&C services. These trades are:

- Chinese Medicine
- Construction Materials
- Food
- Jewellery
- Environmental Protection
- Information and Communications Technologies

When identifying new T&C opportunities during the course of this study, we focused on opportunities that did not overlap with those already identified by HKCTC; but rather were aligned with HKCTC's strategic development direction.

When investigating institutional initiatives that may foster sustainable and healthy growth in the T&C industry, we took into account the current efforts being made by the government and emphasized identifying options that were both new and complementary to existing policy measures and support mechanisms.

Study Approach

In order to collect the prevailing views of the industry and obtain the latest market intelligence in order to explore new development opportunities for T&C services, we adopted the following investigative approach:

- Review external future trend projections and research/ market studies;
- Conduct in-depth interviews with key stakeholders in the T&C industry, including government officials, industry associations, T&C trade facilitators, and testing and certification bodies;
- Conduct interviews with HKPC representatives sitting on HKCTC panels; and
- Convene a Hong Kong Industry Network Clusters (HK-INC) consultation session, the purpose being to collect the views of experts from a wider spectrum of stakeholders in T&C trades, including government officials, trade associations, academics, and testing and certification bodies.

Through these approaches, three mainstream development trends were identified as the key drivers of future T&C opportunities, namely: Smart Technologies, Product Sustainability and Green Transport.

To identify particular emergent T&C services, we scrutinized the market prospects of each potential T&C opportunity, using three general criteria:

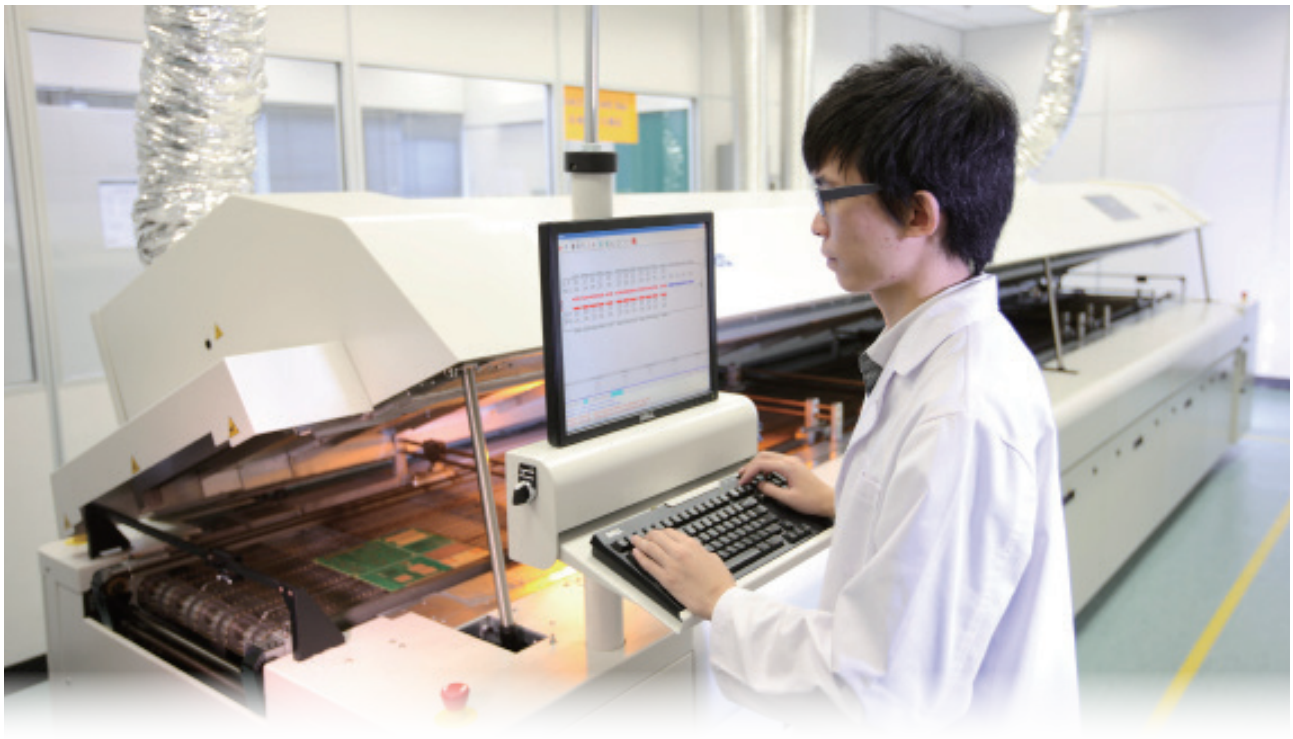
- The existence of appreciable market demand;
- The limited availability of T&C services in Hong Kong; and
- A genuine need in industry and/or society.

For each identified T&C opportunity, we gave due consideration to the major strengths of Hong Kong – namely a high level of integrity and credibility, an internationally-recognized accreditation system, high technical competence of the local T&C industry, proximity to mainland China, and a well-established communications infrastructure, among other criteria – that would accelerate the growth of these emerging local T&C opportunities.

During the consultation interviews, key T&C stakeholders also raised feasible ideas on new institutional measures that could empower industry growth. Some of these ideas were then analyzed and subsequently featured in the report. These options included measures that could foster business development for the industry as a whole, or enhance development for T&C practitioners.

Chapter 2

New Opportunities to Come



Industry Profile

Testing and certification industry provides testing, inspection and certification services in general. Testing is the determination of one or more characteristics of an object according to a procedure. Inspection is the examination of a product design, product, process or installation and determination of its conformity to specific or general requirements on the basis of professional judgment. Certification is a third-party attestation related to products, processes, systems and persons.[1] The T&C industry is a general term referring to businesses which offer services related to T&C.

The T&C industry has over 50 years of history in Hong Kong, developing under the voluntary regime of standards and certification that in general models on many other advanced economies. In its early years, the industry focused mainly on providing services for the manufacturing industry in Hong Kong. More recently, responding to end users' changing needs, the scope of T&C services has broadened to other sectors such as the food, health care and environmental industries. At present, the major economic activities of the T&C industry are technical testing and analysis; cargo inspection, sampling and weighting; and medical and X-ray laboratory services.[2]

Employing a large number of professionally trained staff, the T&C industry has, on average, been able to achieve a relatively high profit margin. In 2012, the industry employed 12,780 people and contributed about HK$5.8 billion (0.3%) to Hong Kong's Gross Domestic Product (GDP).[3, 4] The total business receipts of private independent T&C companies amounted to a total of HK$10.9 billion in 2012, recording an increase of about 27% compared to 2009 (approx. HK$8.6 billion).[5]

"The industry employed 12,780 people and contributed about HK$5.8 billion to Hong Kong's Gross Domestic Product"

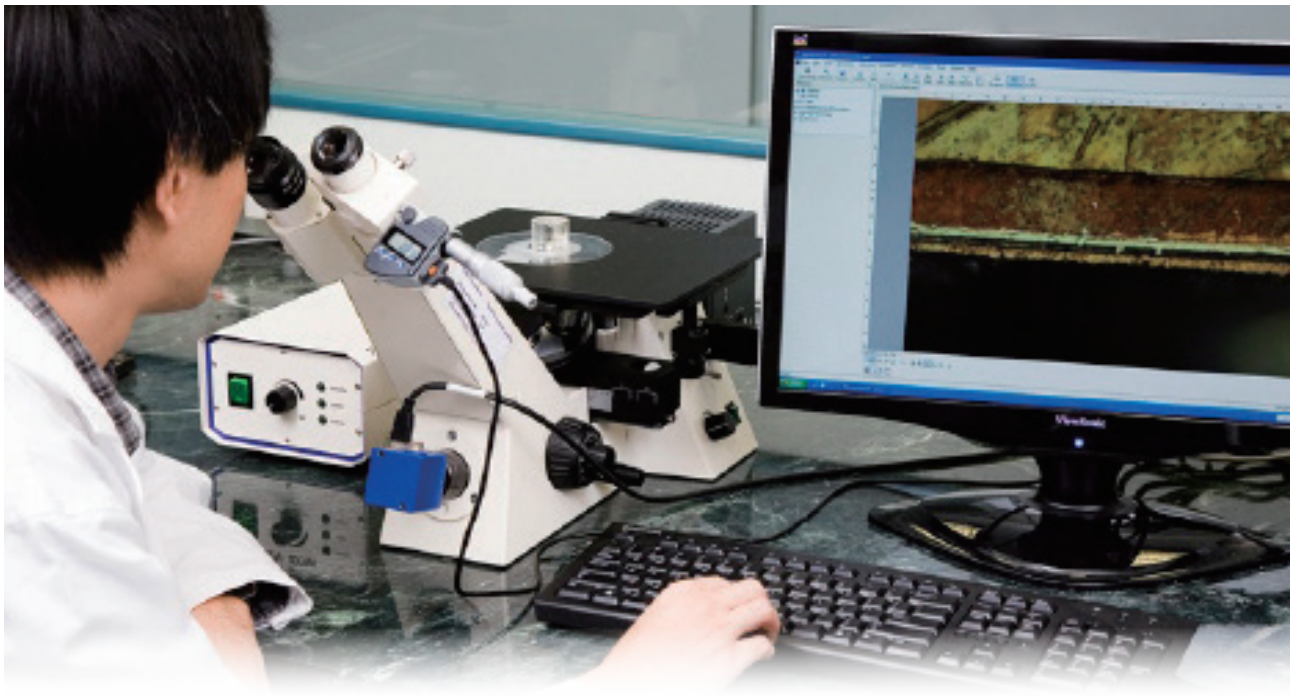
1 *Report of the Hong Kong Council for Testing and Certification 2010-2011*

2 *The Situation of the Six Industries, Hong Kong Monthly Digest of Statistics, Census and Statistics Department*

3 *Statistical Table E103, Census and Statistics Department, 2012 Edition*

4 *T&C Industry Profile, Census and Statistics Department, 2014 (ppt)*

5 *Hong Kong Council for Testing and Certification Annual Report 2013-2014*



"Global T&C market had reached approximately US$113.1 billion in 2010"

(Testing, Inspection & Certification Report 2012, Clearwater Team)

Global Market Outlook

Globally, two major factors have contributed to a positive outlook for the T&C industry: compliance risks due to ever-increasing regulatory requirements around the world and increasing public awareness of corporate social responsibility.

In recent years, several large international markets, such as the European Union and the United States, have strengthened regulatory controls and extended producer responsibilities in numerous areas, product safety and environmental aspects being just two examples. Many other countries and regions, including the Mainland, have also introduced their own regulations or surveillance schemes to monitor product stewardship. To demonstrate their compliance with these requirements to buyers, consumers or government authorities, producers often need to conduct certain testing or obtain third-party certification or assurance.

Thus, T&C services are becoming increasingly important across the supply chain, especially for companies which export products to international markets.

Many companies are motivated to go even beyond regulatory compliance in pursuit of improving their corporate social responsibility, and choose to comply with voluntary industry standards such as ENERGY STAR and ISO standards.

With the international situation creating continuous momentum and numerous T&C opportunities, the industry has experienced the significant growth during 1997-2012 with a CAGR (Compounded Annual Growth Rate) of 5-6 percent and is expected to keep developing at this speed in the coming year. It was also estimated that the value of the global T&C market had reached approximately US$113.1 billion (approx. HK$880 billion) in 2010.[6]

6 *Testing, Inspection & Certification Report 2012, Clearwater Team*

T&C Drivers in Hong Kong

Besides benefiting from the trends in international and domestic markets, the T&C industry in Hong Kong also has a number of competitive advantages that have contributed to the development of the industry:

- Hong Kong hosts the base for many international T&C organizations in the Asia-Pacific region. The Hong Kong T&C industry has a long history of **adopting global best practices and accessing the knowledge and experience of international markets**. The professional expertise and services of the local T&C industry are well-recognized both domestically and internationally.

- Our **geographical and cultural proximity to the Pearl River Delta** allows Hong Kong to provide T&C services to the Mainland manufacturing industries, also known as "the Workshop of the World".[7]

- Having **robust accreditation management systems that are in line with international conventions and norms** enhances the Hong Kong T&C industry's credibility against competitors in the region. Under multilateral recognition arrangements,[8] conformity assessment results issued by accredited establishments in Hong Kong are recognized by 86 mutual recognition arrangement partners in 68 economies.[9]

- Consisting of **professionals with a high level of integrity, credibility, technical and linguistic competence**, particularly crucial to the knowledge-based sector, the T&C industry in Hong Kong is able to stay competitive and thrive in the global market.

7 *Economist- Pearl River Delta: The new Workshop of the World http://www.economist.com/node/1382626*

8 *HKAS is a member of the International Accreditation Forum (IAF), International Laboratory Accreditation Cooperation (ILAC), Pacific Accreditation Cooperation (PAC) and Asia Pacific Laboratory Accreditation Cooperation (APLAC). HKAS is also a signatory to the multilateral mutual recognition arrangements of these cooperative ventures. Under these arrangements, HKAS has 86 mutual recognition arrangement partners in 68 economies.*

9 *http://www.itc.gov.hk/en/quality/hkas/about.htm*

Local Government Initiatives

The potential of the T&C industry in Hong Kong was first identified by the Hong Kong SAR Government in the new millennium, when Hong Kong was still suffering the effects of the global economic downturn. It was the government's belief that, in addition to consolidating core industries, new industries must also be explored. In 2009, the Task Force on Economic Challenges identified the Testing and Certification industry as one of six industries that enjoy clear advantages and have potential for further development; stating that Hong Kong had the potential to develop into a major regional product T&C centre.[10] HKCTC was established in the same year to drive the development of the industry, raise the professional standards and enhance the recognition of the industry in the international arena.[11] HKCTC also formulated a three-year market-driven industry development plan to promote the development of the industry.

10 *Task Force on Economic Challenges, Developing New Economic Pillars*
11 *Hong Kong Council for Testing and Certification website*

Since the establishment of the HKCTC, the government has deployed different strategies to develop the industry and announced initiatives in terms of:

Enhancing Accreditation Services

Introducing new accreditation services such as accreditation for energy management system certification and greenhouse gas validation and verification.

Enhancing Factors of Production

Enhancing factors of production i.e. manpower, technology, capital and land by attracting talent, raising the professional and technical expertise of practitioners and providing funding support, for example.[12]

Focusing Efforts on Specific Trades

Setting up panels for T&C services and promoting new services in specific industries where T&C services have greater potential, for example, Chinese medicine, construction materials, food and jewellery; as well as two additional emerging trades – environmental protection and information and communications technologies.

Promoting Hong Kong's Services

Enhancing the publicity of the T&C industry by setting up exhibition booths at major trade fairs in Hong Kong or abroad, through the platform of the Trade Development Council, and arrange interviews with the media.

Broadening Scope of Service under CEPA

According to the Supplement VII to X of the Mainland and Hong Kong Closer Economic Partnership Arrangement (CEPA), trade liberalization measures are introduced for local industries, including T&C sector. Accredited testing organizations in Hong Kong can perform testing services for the purpose of food and other voluntary product certification for Guangdong on a pilot basis,[13] and perform product testing for the China Compulsory Certification (CCC) System for all existing products processed in Hong Kong which require CCC.[14] The continuous opening of the China market may present more business prospects for T&C service providers in Hong Kong.

12 *Hong Kong Council for Testing and Certification Report 2010*

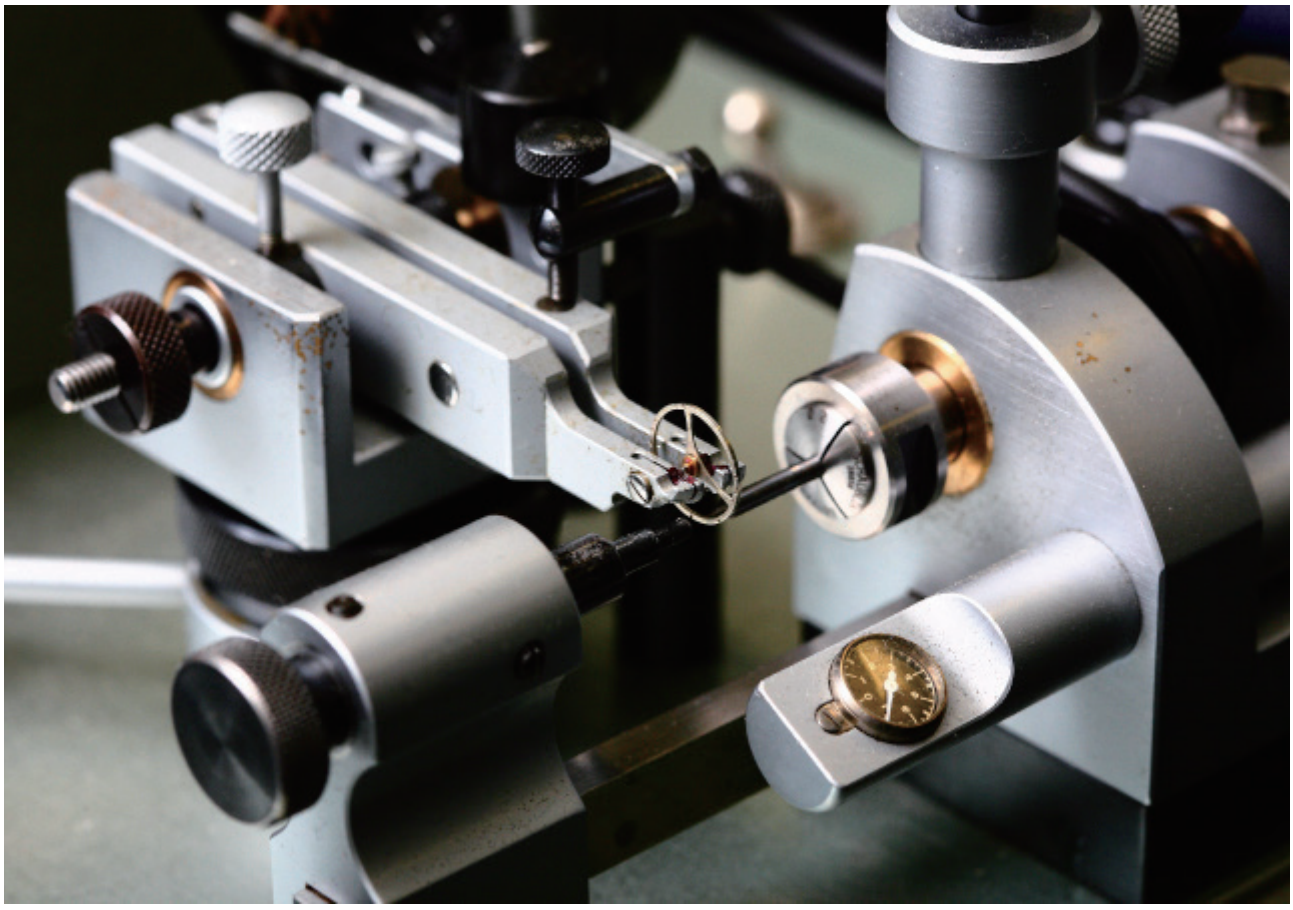
13 *Supplement IX and Supplement X to CEPA*
14 *Supplement VII and VIII to CEPA*

In light of a positive global market outlook, Hong Kong's local competitive advantages and the government's recent initiatives to develop the industry, this study was conducted to help the T&C industry in Hong Kong identify a number of mainstream trends which may bring significant development potential to the industry. This report will highlight and elaborate on three mainstream trends in the following sessions, providing detailed background information and listing the business opportunities of each. These trends are:

Smart technologies;

Product sustainability; and

Green transport.



Chapter 3

Smart Technologies:

Spurring Technological Innovation through Testing and Certification

About the Trend

Five billion "smart" connected devices have so far been deployed around the world. It is predicted that this number will increase to 50 billion by 2020.[15]

Advancements in computing power and connectivity are the key drivers of growth in this global industry.

With their higher speed and lower cost, computer chips are now small and powerful enough to be installed everywhere – from PCs to household appliances.

At the same time, the growth of connectivity has enabled communications operating at extremely high data transfer rates. The mobile data rate has also drastically increased, thanks to the introduction of new wired and mobile technologies. Device-to-device communication allows links to be created between devices using Bluetooth and Near Field Communication (NFC) technologies. New concepts like "The Internet of Things" (IoT) are moving society towards an intelligent, invisible network "fabric" of items that can be sensed, controlled and programmed.

Concurrently, improvements in power management systems – namely higher power, longer battery life, lighter weight and smaller size – have catalyzed the development of smart technologies, especially for such power-hungry mobile devices as smartphones.

Hong Kong exports a wide range of IT equipment. According to the latest available statistics, Hong Kong was the world's second largest exporter of computer parts and accessories in value terms in 2011.[16]

A HKTDC research[17] conducted in September 2013 indicates that Hong Kong companies have changed to strengthen their competitiveness by moving towards businesses with higher value-added and more sophisticated products. Smart products are highly representative of this market trend. Here are some examples of smart technologies:

15 *Evolution of the IoT:* http://www.ti.com/lit/ml/swrb028/swrb028.pdf

16 *HKTDC Research* http://product-industries-resea rch.hktdc.com/business-news/article/Electronics-Electricals/Information-Technology-Equipment-Industry-in-Hong-Kong/hkip/en/1/1X3VBFK7/1X0040HJ.htm

17 *HKTDC Research* http://product-industries-research.hktdc.com/business-news/article/Electronics-Electricals/Electronics-Industry-in-Hong-Kong/hkip/en/1/1X3VBFK7/1X00401Z.htm

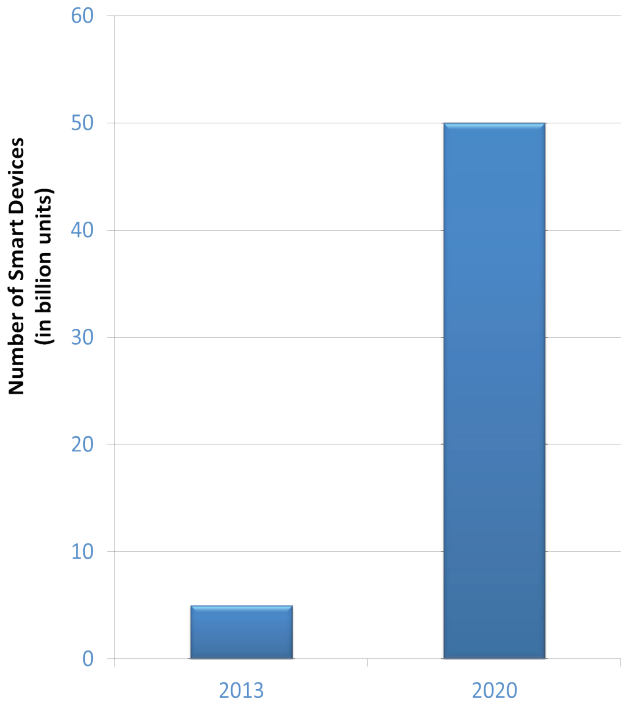


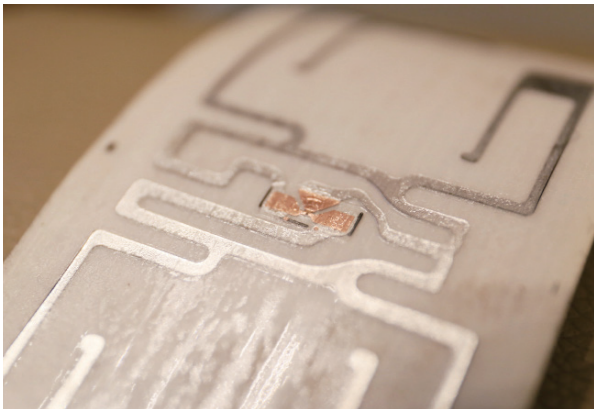
Figure 3.1 Number of Smart Devices

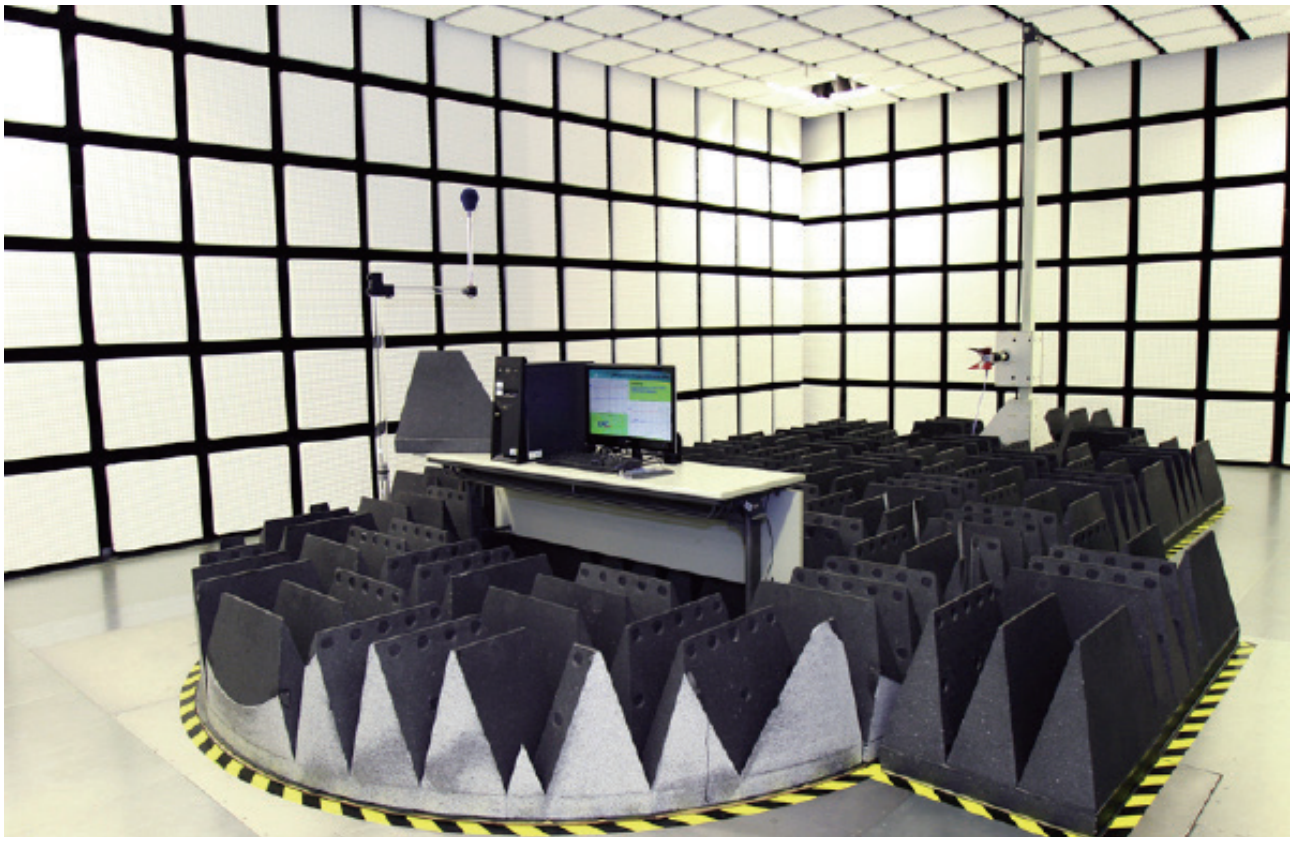
Advanced Driver Assistance Systems (ADAS) and Self-parking Systems for automobiles utilize advanced sensory and intelligent control technologies. Automobiles with ADAS alert drivers to dangerous situations to enhance driving safety; while self-parking systems help drivers park their vehicles automatically and precisely.

Smart Home Appliances such as home audio theatres, refrigerators, and washing machines are more intelligent than ever. They can follow users' operating preferences, work in an energy saving way, and even be operated remotely via the Internet and mobile apps (for example dlna, which connects home entertainment units to home network). Smart technologies are helping to bring the concept of the "smart home" to life.

Wireless Charging allows the transfer of energy without a power cord. Smart devices, which require a common platform for charging, can be charged easily and conveniently.

Near Field Communication (NFC) technologies and Radio-Frequency Identification (RFID) make use of electromagnetic fields to transfer data wirelessly. These technologies automatically identify and track people, goods, or payments. Management and control of various items can be made more effective with the application of this type of smart technology.





Why T&C Matters

To support the development of fast-growing smart technology applications, the T&C industry can play a vital role in providing different T&C services to facilitate product safety, the efficient use of frequency spectrums and the proper adoption of new technical specifications to further enhance future development of these technologies.

Product Safety

Smart technologies involve both electric and electronic devices. Such devices have to fulfill regulatory safety standards and are subject to various certification schemes. These standards and regulations protect end users from potential safety hazards. The T&C industry helps manufacturers obtain regulatory and voluntary approval to ensure that these products comply with these requirements around the world.

Electromagnetic Compatibility (EMC)

Many smart technologies make use of various wireless spectrums. Poor design of wireless transmitters and receivers may result in a device causing serious interference with its neighboring devices. To govern the efficient use of these spectrums, different countries have enacted different regulations to control spectrum usage. The T&C industry tests smart devices for radio-frequency interference and electromagnetic immunity behaviour to help the manufacturers of smart devices cope with the ever-changing regulatory environment.

Fulfilling Technology Alliance Specifications

There are several international organizations which set out and govern the proper use of smart technologies. These organizations set up certification schemes, which include protocol and interoperability testing. Protocol testing is required to ensure that smart devices can communicate correctly; while interoperability testing is designed to confirm that devices can “walk across” different platforms. A typical example is the seamless “handoff” between 2G and 3G mobile systems. Standardization associations, such as the Bluetooth Alliance, the Wi-Fi Alliance, GCF, PTCRB, the USB-IF and WPC, need laboratories to be able to offer such certification programmes.

All in all, the role of the T&C industry is to stay on top of the latest developments in standards and technology and provide different T&C services to protect consumer safety, safeguard the proper use of frequency spectrums, and ensure the proper application of new technologies.

"T&C industry can play a vital role to support the development of fast-growing smart technology applications"

Growth Drivers

Evolving Governance by Technology Alliances

With new smart technologies evolving rapidly, different alliances representing different technology specifications have been formed. These alliances are designed to introduce certification systems to govern the use of the technology they represent. For instance, the Wireless Power Consortium (WPC), which governs wireless charging, has established the "Qi" certification scheme. The increasing number of such technology groups has spurred greater demand for T&C services.

New Standards and Regulations

Wherever there are new technologies and new product types, there must also be additional standards and regulations. Taking 4G systems as an example, the new usage of frequency spectrums has meant the introduction of new set of RF regulatory tests. There are an enormous number of emerging systems in the "smart world" and thus a virtually unlimited number of opportunities for the T&C industry.

Increasing Need for Third Party Test Services

A common test facility platform would help businesses that are obliged to make large investments for product verification. For some establishments, it is impractical to maintain high levels of investment in in-house testing equipment. T&C industry players that can accommodate a higher number of facilities and human resources could act as a shared platform for testing procedures. Not only might this create new business opportunities within the industry, but also minimize the cost and time involved in their development.

T&C Future Potential

Wireless Charging

The rapid adoption of smartphones is the driving force behind the coming explosion in the global wireless phone charging market: the market is anticipated to increase in size from 2013's HK$0.02 billion to a projected figure of HK$262 billion in 2019, given the prevailing assessment that wireless charging will be a prerequisite feature of smartphones by that time.[18]

Faster, lighter and more powerful smart devices need strong rechargeable battery support. Tablets, smartphones, smart watches, and even smart glasses will need a common platform for recharging, to avoid the usage of multiple power adaptors and cables and the resultant "desktop clutter".

Wireless charging is a convenient solution. By taking advantage of electromagnetic induction or resonance principles, power is transferred from charging pads to the devices themselves. The "beauty" of this is the replacement of multiple chargers and cords with a single flat charging pad or a ruler-sized charging bar that can be placed just below a PC monitor.

Despite the fact that wireless charging has the potential to greatly enhance the user experience, there are concerns with this technology.

"Global wireless phone charging market is anticipated to increase to HK$262 billion in 2019"

(Wireless Phone Chargers: Market Shares, Strategies, and Forecasts, Worldwide, 2013-2019)

18 *ReportsnReports.com, Wireless Phone Chargers: Market Shares, Strategies, and Forecasts, Worldwide, 2013-2019(2013)*

Electromagnetic Field (EMF)/Specific Absorption Rate (SAR)

Wireless charging makes use of electromagnetic induction or magnetic resonance to transfer the power. Exposure to the resultant electromagnetic field generated may pose safety risks to human health due to EMF and SAR issues. Different countries have developed various guidelines, bulletins and standards which address such EMF/SAR issues.

Interoperability

To realize the goal of reducing "desktop clutter", all smart devices need to work with the same wireless charging platform. A broad census of technical standards is needed to ensure interoperability across wireless charging products and platforms. This will ensure that the devices complying with a particular standard are able to work seamlessly with other certified devices.

These twin concerns have created T&C opportunities in the area of wireless charging devices; not only to ensure customer satisfaction, but to help drive wide adoption of this evolving technology.

Three alliances: the Wireless Power Consortium (WPC),[19] the rezence,[20] and the Power Matters Alliance (PMA)[21] have been established to develop standards to ensure both the performance and the interoperability of devices.

19 *Wireless Power Consortium http://www.wirelesspowerconsortium.com/cn*
20 *A4WP http://www.rezence.com*
21 *Power Matters Alliance http://www.powermatters.org*

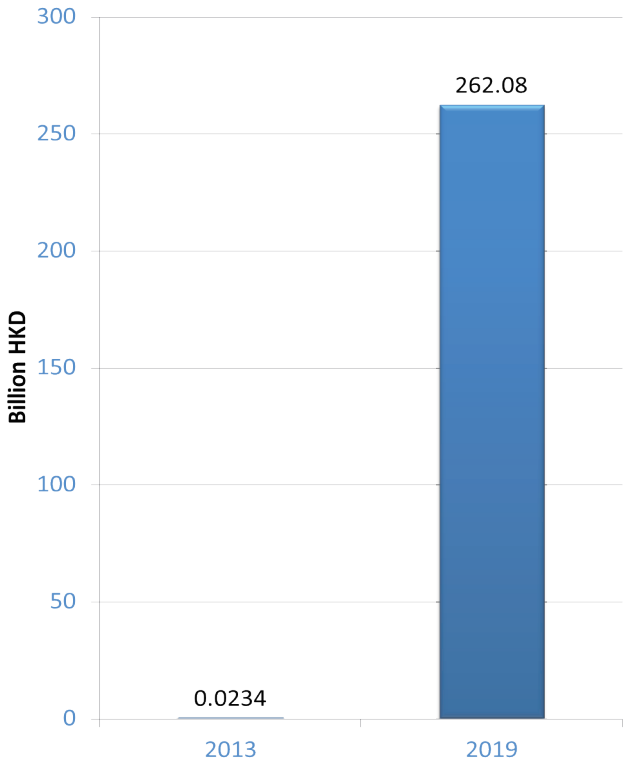


Figure 3.2 Worldwide Wireless Phone Charging Market Forecasts

"Qi" Certification

WPC has developed a global certification programme called "Qi" for wireless charging devices. The Qi standard was initially based on electromagnetic induction, and extended to magnetic resonance in version 1.1.

Qi is a well-established standard, and more than 400 Qi-enabled devices are registered on the WPC website.[22] The consortium has over 200 members from diverse industries, including industry giants like LG, Huawei, Docomo, and Verizon. Qi is also broadly accepted by large automotive industry companies such as Toyota and Mercedes-Benz.

PMA and A4WP

PMA and A4WP were both formed in 2012. On 11 Feb 2014, the two associations signed an agreement which will establish the global interoperability of these two leading wireless power standards.

The "ecosystems" of PMA and A4WP standards are still in the developing stage. However, their potential should not be neglected, as the agreement made between them will benefit the industry as a result of the harmonization of technical standards for interoperability.

Local T&C service providers possess the knowhow and resources to develop the associated tests. However, the industry appears conservative about the prospect for future growth in the demand of such testing services. The Qi standard, which has already gained market acceptance, has only five test labs providing T&C services in the greater China region. Considering the massive number of wireless charging devices and models that should hit the market in the near future, and the commitment of the industry to this rapidly growing market, promising business opportunities exist in the provision of T&C services for wireless charging standards; in particular the highly-promising Qi standard.

22 *AUDI Demonstrates Qi Wireless Charging at CES 2014, Wireless Power Consortium, 9 Jan 2014* http://www.wirelesspowerconsortium.com/data/downloadables/1/2/1/7/20140109-audi-demonstrates-qi-wireless-charging-at-ces-2014.pdf

We recommend the following measures to accelerate the development of T&C services for wireless charging in Hong Kong:

1. Looking for opportunities to develop the capabilities of existing certification programmes for wireless charging products. Since interoperability is key to deploying the technology, there is a demonstrable market need to verify that it is properly applied.

2. Investigating the potential for providing EMC/safety-related testing for wireless charging products, as EMC and safety testing are essential for all products entering the global market.

Near Field Communication and Radio-frequency Identification

Near field communication (NFC) traces its roots back to radio-frequency identification (RFID), which makes use of radio frequency communications between a sensor and a tag to facilitate data transmission and tag recognition.

NFC is a subset of RFID with a shorter communication range for security purpose.[23]

According to IHS technology report:[24]

"NFC will be included in 64% of mobile phones shipped in 2018 globally, up from 18.2% in 2013, according to a new forecast from IHS Technology."

Aligning with this global trend, the local market of NFC is also picking up, as indicated by the support of handset manufacturers, utilities and the Government.

The Asia NFC Alliance was formed in Hong Kong in early 2014 by Japanese carrier KDDI, Korea's SK Planet, Taiwan's Chunghwa Telecom and Hong Kong Telecommunications to promote adoption of NFC applications in Asia, using a common NFC tag specification.[25]

Moreover, the Hong Kong Association of Banks has issued the guideline of "NFC Mobile Payment in Hong Kong" in November 2013[26] recommending the security best practices in payment and listing out technical standards regarding use of NFC technology.

In line with the rapid development of the NFC technology, the need for associated T&C services also grows strongly, attributing to the fact that NFC devices are usually small consumer products with short product-life-cycle and vast spectrum of models. The number of devices need to be tested is considerably huge.

On the other hand, NFC's mothering technology, RFID has its own development potential as well.

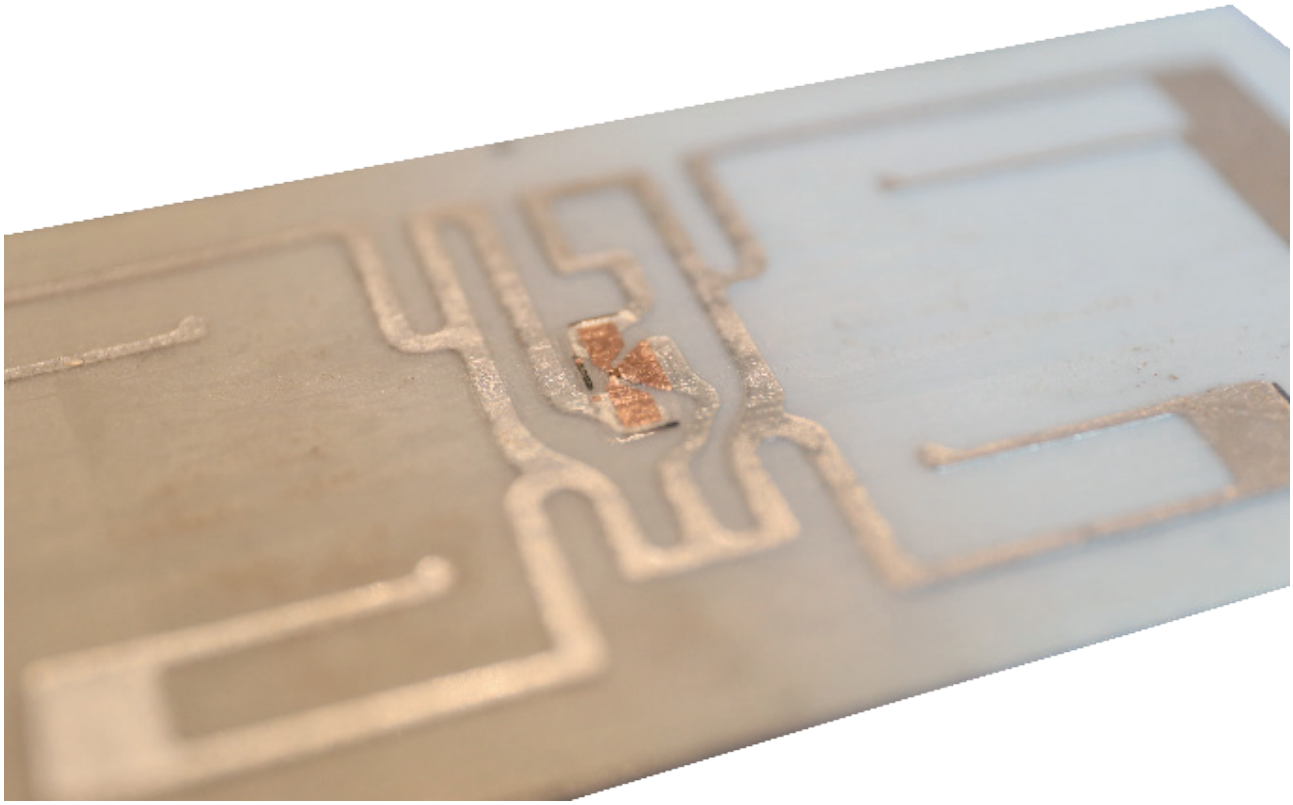
Globally, the market value of RFID-related products and

23 *NFC Consortium http://www.nearfieldcommunication.org/history-nfc.html*

24 *IHS, Near Communications Report (2014)*

25 *PR Newswire http://www.prnewswire.com/news-releases/asian-telecom-operators-form-asia-nfc-alliance-247085641.html*

26 *HKAB NFC Mobile Payment in Hong Kong, Best Practice http://www.hkab.org.hk/DisplayArticleAction.do?sid=28&ss=2*



services, including tags, readers, software and services for RFID cards, labels, fobs and all other form factors is expected to rise to HK$71.76 billion in 2014 and increase further to HK$235.87 billion in 2024.[27]

According to IDTechEx RFID Forecasts,[28] by 2018, the value of the RFID market will be over five times the size it was in 2008, while the number of tags supplied will be over 300 times greater.

Hong Kong, as one of the world's most developed economies, is expected to see similar development trends in the industry. Essentially, this means that the RFID market has yet to be saturated.

With the strong market profiles, both NFC and RFID have a good T&C need.

Testing and Certification Opportunities

The Hong Kong Association of Banks has published a best practice guideline in late 2013 recommending the technical standards that should be fulfilled for high level NFC transaction security.

This "Best Practice" recommends a list of widely adopted technical standards to be complied in order to improve the interoperability, safety and security of NFC mobile payment.[29] New standards will continue to evolve and hence

"NFC will be included in 64% of mobile phones shipped in 2018 globally"

(IHS Technology)

27 *RFID Forecasts, Players and Opportunities 2-14-2024, IDTechEx, http://www.idtechex.com/research/reports/rfid-forecasts-players-and-opportunities-2014-2024-000368.asp?viewopt=showall*

28 *RFID Forecasts, Players and Opportunities 2-14-2024, IDTechEx, http://www.idtechex.com/research/reports/rfid-forecasts-players-and-opportunities-2014-2024-000368.asp?viewopt=showall*

29 *HKAB http://www.hkab.org.hk/DisplayArticleAction.do?sid=28&ss=2*

bring further development opportunities for the T&C industry.

Besides, the NFC Consortium,[30] which aims to standardize the use of the technology, has established a certification scheme to verify products for digital protocol and tag operations and address security and interoperability issues.[31]

Given the upward trend of NFC technology and this systematic certification approach, it is likely that the need for NFC certification will increase significantly in the coming years.

RFID is a relatively well-developed technology and has enormous potentials in different applications. For instance, RFID tags can be used for tracking of liquid goods and can also be applied in logistics and security control of concrete samples. In fact, RFID solution providers are claiming that their products and solutions will help clients save time and cost through superior performance.

Despite the large application potentials of RFID, currently there is no representative certification scheme which targets to ensure the quality and performance of RFID tag when it is used in different applications or scenarios.

Although there are various product import testing requirements imposed by regulators for RFID, apparently these requirements are not related to the quality and performance of RFID tag that is used in various applications.

In view of the above, a creditable T&C scheme based on international standards is helpful to validate the claims and provide a structure for the recognition of RFID performance in different applications. This would facilitate end users to select RFID tag that suits their needs.

30 *NFC Consortium* http://www.nearfieldcommunication.org/history-nfc.html

31 *NFC Certification* http://www.digitimes.com.tw/tw/B2B/Seminar/Service/download/053A108220/053A108220_TBE34WFX6LIO97F4PVUW.pdf

Technical standards widely adopted in NFC services in global market

- **ISO Standards**
  - * Contact and contactless smart cards
- **ETSI Standards**
  - * Remote APDU structure for UICC-based applications
  - * Secure packet structure for UICC-based applications
  - * SWP and HCI interfaces
- **GlobalPlatform Standards**
  - * TSM to TSM and PSP to TSM messaging specifications
  - * SE-recommended architectures
- **EMVCo Standards**
  - * EMV Profiles of GlobalPlatform UICC configuration
  - * ICC Specifications for payment systems (book 1 to 4)
  - * Contactless entry point specifications
  - * EMV card personalization specification
  - * Application activation user interface, usage guidelines and PPSE requirements

We recommend the following measures to accelerate the development of T&C services for NFC and RFID in Hong Kong:

NFC

1. Explore future market trends for NFC certification services, so as to select the certification scheme and test standards that best suit the needs of the local NFC market.

2. Investigate the need to build up service capability for additional regulatory approval testing on NFC devices so as to comply with different countries' import regulations.

RFID

1. Investigate the possibility of introducing a certification scheme at both the application and technical levels for the technology, in order to assure the application performance of emerging RFID products and solutions.

T&C for Thought

USB Power Delivery

The USB battery charging standard for mobile devices has been broadly adopted across the world.[32] Using the current USB3.0 standard, the power delivered by USB chargers can be as much as 4.5W. To extend this application further, tablet PCs, notebook computers and even monitors could be powered or recharged by USB plugs with the introduction of USB power delivery technology – a new USB specification which supports power transmission up to 100W.

The USB Implementers Forum[33] has introduced certification testing requirements for the application of this technology. Among the new tests introduced include backward compatibility, power measurement, and data rate measurement.

It is foreseeable that the major retailers worldwide would require their manufacturers to comply with such certification requirements. Some retailers may even specify that certification tests be carried out by trusted laboratories.

With Hong Kong's established technical competence and credibility, the local T&C industry enjoys competitive advantages that will allow us to meet the business demand for the T&C services need for USB Power Delivery devices.

32 *USB Power Delivery* http://www.usb.org/developers/powerdelivery

33 *USB-IF* http://www.usb.org/about

SUMMARY

T&C plays a vital role in supporting the development trends in smart technologies; particularly in terms of ensuring product safety, in facilitating the efficient use of frequency spectrums and the proper adoption of new technical specifications and industry requirements.

In light of the positive market outlook for smart technologies, there exists significant development potential for the local T&C industry.

For example, **Wireless Charging, Near Field Communications (NFC)** and **Radio-frequency Identification (RFID)** are some of the emerging smart technologies and applications which may become dominant, and for which T&C services would certainly be needed.

Hong Kong enjoys a competitive advantage in terms of developing related T&C services for the smart technologies, due to:

- Our technical competence which is trusted by major retailers worldwide;
- Our internationally-recognized integrity and credibility;
- Our advanced logistics and telecommunication network; and
- Rapidly growing demand from users worldwide.

We recommend the following measures to accelerate the development of T&C services for smart technologies in Hong Kong:

- Further investigating the international regulatory approval T&C requirements relevant to smart technologies, aiming to identify focus areas for local T&C business development and service capability enhancement; and
- Enhancing smart technology-related business networking opportunities between local T&C service providers, manufacturers, and major retailers worldwide in order to explore the establishment of new business partnerships.

Chapter 4

Product Sustainability:

Creating Differentiating Advantages through Testing and Certification

About the Trend

> "We are currently using 50 percent more resources than the Earth can provide"
>
> (WWF)

The world's population continues to rapidly expand, reaching 7.2 billion in 2013.[34] With a growing proportion of people living in urban environments and leading resource-intensive lifestyles, our demand for products and services is creating profound impacts on resource use, at a level never before seen in human history.

According to the World Wide Fund for Nature (WWF), we are currently using 50 percent more resources than the Earth can provide.[35] At the same time, 1.2 billion people live in extreme poverty, on less than US$1.25 a day.[36]

To address this formidable challenge, the world needs to decouple economic development from unsustainable resource use. From a business perspective, this means making operations more efficient on one hand, while creating products or services that add more value with less resource input on the other.

Many forward-thinking businesses have already adopted sustainable practices. A 2013 report by MIT's Sloan Management Review found that nearly 50 percent of over 2,600 companies surveyed globally had changed their business model as a result of sustainability opportunities.[37] More and more companies have reported profit from their sustainability efforts, either from returns on improved operational efficiencies, or profits gained when innovative products meet higher sustainability standards – e.g. products with improved energy efficiency, resource utilization rate, and green features.

In Hong Kong, we have also seen a surge in businesses embracing the opportunity to offer products or services that are less materials or energy-intensive, and aligning themselves with the global sustainability movement. To thrive in the intense competitive environment brought about by globalization, "sustainability innovation" is now a way for companies to secure competitive advantage; especially when their products target markets with higher sustainability requirements.

---

34 *United Nations Population Division, Population, Development and the Environment 2013 Wallchart*

35 *World Wide Fund for Nature, Zoological Society of London and Global Footprint Network, Living Planet Report 2012: Biodiversity, biocapacity and better choices (WWF International, 2012)*

36 *The World Bank, World Development Report 2014: Risk and Opportunity (World Bank, 2013) (http://siteresources.worldbank.org/EXTNWDR2013/Resources/8258024-1352909193861/8936935-1356011448215/8986901-1380046989056/WDR-2014_Complete_Report.pdf)*

37 *MIT Sloan Management Review, The Boston Consulting Group, Sustainability's Next Frontier: Walking the talk on the sustainability issues that matter most (MIT Sloan Management Review, 2013)*

Why T&C Matters

Today, the average citizen is constantly bombarded with marketing from companies offering goods and services which purport to be sustainable. It is quite difficult for the layperson to discern between products which genuinely "make a difference" versus those that are merely "greenwash".[38] According to TerraChoice, a significant portion of "greener" products still present false or inaccurate environmental claims or lack transparency in terms of the claimed environmental impacts of the products.[39]

Meanwhile, significant business losses have been recorded due to the recall of products which fail to meet health, safety or environmental criteria. More than 2,200 products posing a risk to the health and safety of consumers or to the environment were reported by European countries in 2012.[40]

The United States Consumer Product Safety Commission (CPSC) made over 400 recalls in 2012 of products which either violated mandatory health or safety standards, or which posed a substantial risk of harm to the public.[41] More than US$6.94 million in civil penalties were paid to settle legal disputes arising from these recalls.

As products claiming to be sustainable have become prevalent on the market, so have consumer scrutiny and business demands for better assurance. It is projected that T&C services for various global and local sustainable product standards will be used more frequently and comprehensively to authenticate claims of sustainability in an independent and transparent manner.

The use of T&C will form a crucial part of the foundation for the future development of sustainable products. At the same time, it will become equally crucial for corporations to use T&C to protect their brands against greenwashing, as well as to mitigate the risks of financial loss from product recall, legal claims and damage from negative publicity.

38 *According to Scientific American, greenwashing is what happens when a hopeful public eager to behave responsibly about the environment is presented with "evidence" that makes an industry seems friendly to the environment when, in fact, the industry is not as wholly amicable as it might be.*

39 *TerraChoice, The Sins of Greenwashing—Home and Family Edition 2010, (Terrachoice, 2010)*

40 *European Commission, Keeping European Consumers Safe 2012 Annual Report on the operation of the rapid alert system for non-food dangerous products (European Commission, 2012)*

41 *United States Consumer Product Safety Commission, 2012 Annual Report to the President and Congress (U.S. Consumer Product Safety Commission, 2012)*

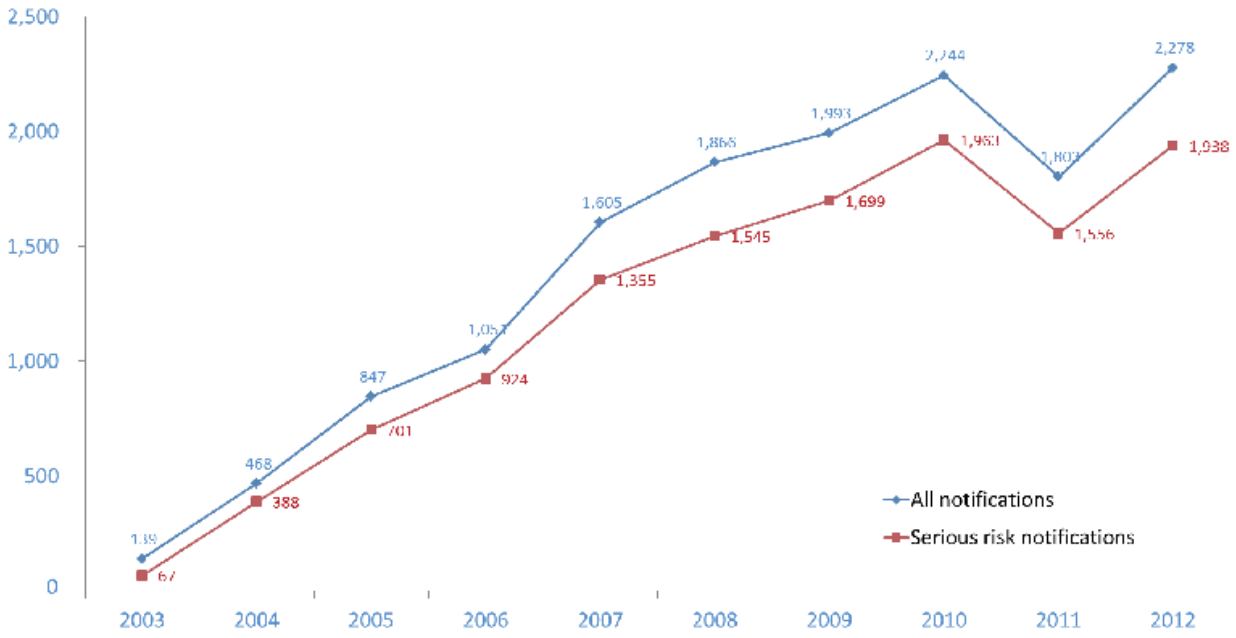


Figure 4.1 No. of Notifications of Consumer Products Posing Serious Risks to Health and Safety(2003-2012)
Source: European Commission

Growth Drivers

Evolving Standards and Regulations

With increasingly stringent regulations, combined with a transition towards more comprehensive standards, new sustainability-related T&C service needs will be generated by a wide variety of initiatives, for instance the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) Directive of the EU, the Restriction of Hazardous Substances Directive (RoHS 2.0), the China RoHS, the EU Toy Safety Directive, carbon management, product eco-design requirements, and others.

Growth should be particularly strong in emerging economies in terms of applying standards to the domestic market. Chemical tests for consumer goods like textiles, cosmetics and appliances will continue to spur demand for T&C services in the global context.[42]

With the recent enactment of the Trade Descriptions Ordinance in Hong Kong, protection for consumers against "false trade descriptions of services or goods" and "misleading omissions" will be enhanced.[43] This is expected to produce further T&C service needs in businesses that need reliable proof of their sustainability performance.

Growing Product Sophistication

In today's extremely competitive market, companies will continue to create and define new standards for quality and sustainability through certification and labeling schemes in order to maintain their competitive edge, generating more T&C services as a result.

Prevalent Social and Environmental Concerns

To mitigate risks and financial losses, businesses will be more willing to invest resources in T&C processes; to better assure sustainability performance, address intensifying stakeholder concerns, and avoid the risk of consumer boycotts. Likewise, distributors and retailers of consumer goods will require that their suppliers obtain certificates which guarantee not only product quality and safety, but also adherence to sustainability principles.

Increasing Reliance of Outsourcing for Testing

With increasing levels of regulations and requirements which need to be met, it is becoming costlier to perform in-house product testing. In order to reduce costs associated with managing in-house testing facilities, equipment, and expertise, many companies are outsourcing their inspection and testing to third party service providers to help them meet their compliance needs.[44]

42 *Clearwater Corporate Finance, Testing, Inspection & Certification Report 2012*

43 *Protection of Consumers' Rights - the Trade Descriptions Ordinance, Chapter 362, Customs and Excise Department, HKSAR Government*

44 *Clearwater Corporate Finance, Testing, Inspection & Certification Report 2012*

T&C Future Potential

Product Carbon Footprint Accounting, Labelling and Verification

Climate change is one of the greatest threats facing humankind. Global CO_2 emissions in 2012 reached a record high of 31.6 gigatonnes.[45] Nations worldwide have set goals to reduce emissions both individually and collectively. China, a major global carbon emitter, established ambitious carbon reduction targets for its provinces and business sector in its 12th Five Year Plan.

Many forward-thinking corporations are making paradigm shift towards low-carbon operations, reaping tangible returns on investment through improving operational efficiencies, building a reputable corporate image, and becoming prepared for future regulatory challenges.

Carbon footprint accounting or carbon auditing plays a pivotal role in carbon management for businesses. It helps companies fully understand their carbon footprints, and how resources like electricity, water, fuel, and paper are consumed over time. Cost-effective carbon reduction solutions can be identified through the auditing process and subsequently adopted to improve operational efficiency.

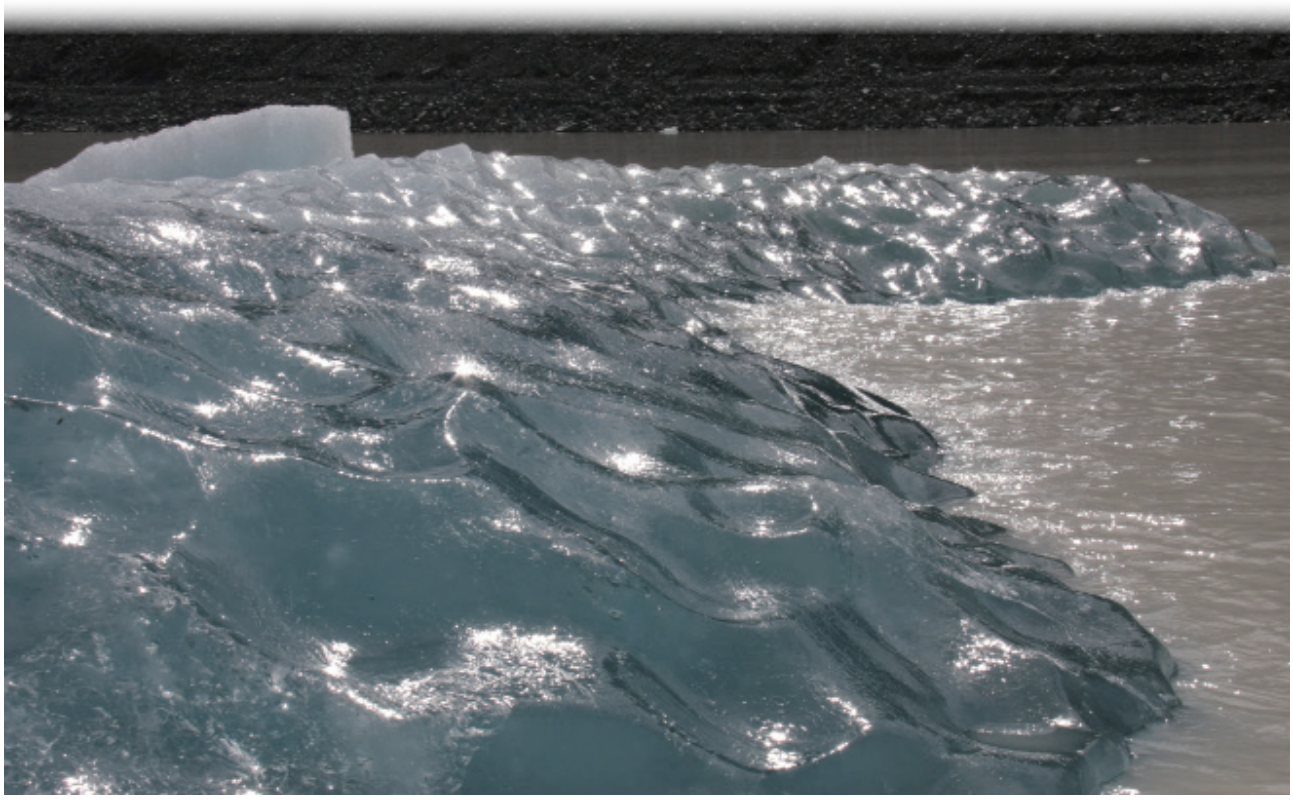
Although corporate carbon reporting has yet to become mandatory in Hong Kong, the concept is gaining momentum. Hong Kong Exchanges and Clearing Limited has published its Consultation Conclusions on its Environmental, Social and Governance (ESG) Reporting Guide,[46] revealing a plan to implement the guide as "recommended practice", with a view to moving to a "comply or explain" basis by 2015. The carbon emissions of a company's operations would be one of the key reporting indicators. In view of the rising concerns of investors, businesses will need to be prepared to measure and report their carbon impact in response to these regulatory challenges.

As carbon reduction gradually becomes "business as usual", companies are starting to measure and reduce the emissions in their products, services and supply chains. This presents new market opportunities for the T&C industry around product carbon footprint (PCF) accounting.

PCF accounting is a means to measure and manage the carbon emissions generated along the lifecycle of a product, from raw

45 *International Energy Agency, World Energy Outlook 2013 (IEA, 2013)*

46 *Hong Kong Exchanges and Clearing Limited, Consultation Conclusions on Environmental, Social and Governance (ESG) Reporting Guide, (HKEx, 2012)*



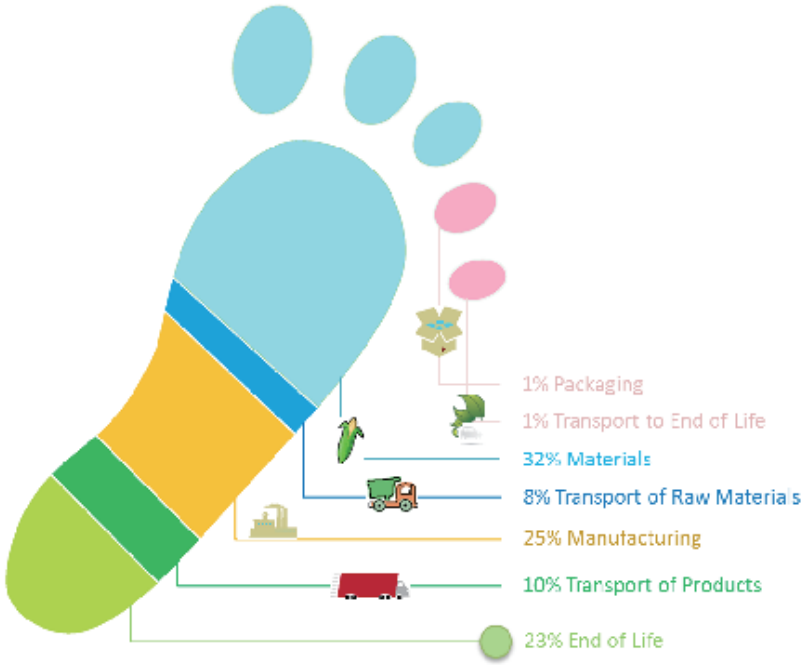


Figure 4.2 Scope of Carbon Emissions Generated Along a Typical Product Lifecycle

materials acquisition through production, transportation, product use and eventually end-of-life treatment. ISO 14067 is a widely-adopted international standard for PCF analysis.

Through building an inventory of the carbon emissions produced at each stage of the product lifecycle and subsequently making improvements in carbon emissions reductions, businesses will be able to realize cost savings and demonstrate their green credentials at the same time.

Some overseas countries have started to introduce institutional measures to support the development of PCF accounting and labelling. For example, France has piloted a national scheme of "Environmental Product Declaration" to require environmental impacts (including carbon footprint) of products to be quantified and communicated with consumers. Since 2011, more than 160 product manufacturers and exporters of France have participated in the scheme.[47]

In South Korea, the Korea Environmental Industry & Technology Institute (KEITI) has established a carbon label for the certification of more than 360 goods and services covering consumer goods, transport services, electronic appliances and food. To incentivize adoption of the labelling, the South Korean Government has introduced an institutional framework of "Basic Law on Low Carbon and Green Growth", which enforces the country to spend 2% of its annual GDP in low carbon production and consumption.[48]

In terms of T&C service opportunities, product manufacturers or brands may require carbon footprint accounting and verification to provide customers with proof that their product carbon claims are true and traceable.

For products participating in recognized carbon labelling schemes, businesses are normally required to employ an independent "carbon footprint professional" to verify that the product conforms to the assessment criteria of the respective scheme. The acquisition of a well-recognized carbon label is a simple and unequivocal tool which communicates a producer's environmental commitment to its customers.

47 *PEF World Forum (http://www.pef-world-forum.org)*

48 *KEITI (http://www.keiti.re.kr/eng/action.do)*

Technical notes on ISO 14067

ISO Technical Specification 14067:2013 is an internationally-recognized standard developed to facilitate the quantification and reporting, in a transparent manner, of carbon emissions over the whole lifecycle of products and services.[49]

This standard is consistent with other standards, namely ISO 14025 (environmental labels and declarations), ISO 14044 (lifecycle assessment) and BSI PAS 2050 (specification for the assessment of the lifecycle greenhouse gas emissions of goods and services).

49 *ISO/TS 14067 (2013) Greenhouse Gases – Carbon Footprint of Products – Requirements and Guidelines for Quantification and Communication.*

Data gathered from PCF analysis can also help product designers, materials suppliers, contractors and end users make environmental improvements through eco-design, low-carbon manufacturing and green logistics.

Recently, the development of the PCF analysis market has been gaining traction in Hong Kong. The Chinese Manufacturers' Association of Hong Kong (CMA), with the support of Carbon Trust, began developing a PCF accounting and labelling scheme in July 2013.[50] The CMA aims to have 100 participating manufacturers from sectors including the food, textiles, electronic goods and building materials industries. In parallel, the Construction Industry Council (CIC) has launched a carbon labelling scheme for construction materials . This scheme adopts a "cradle to gate" carbon auditing approach which takes account of the emissions generated from manufacture until the product reaches the construction site.

50 *The Chinese Manufacturers' Association of Hong Kong, CMA Corporate Announcement 2013 (http://www.cmatcl.com/ContentFiles/1344/carbon_footprinting_and_labelling_scheme_for_hk_businesses_eng.pdf)*

To verify that the product conforms to the assessment criteria of the scheme, the results obtained from the carbon audit will have to be verified by a GHG Validation/ Verification Body (VVB) accredited by Hong Kong Accreditation Service (HKAS) or equivalent accreditation programmes.

Cement products and steel are some of the pilot construction materials for the CIC's scheme. The product scope will gradually expand, which may drive further demand for PCF analysis and verification services.

We recommend the following measures to accelerate the development of PCF accounting, labelling and verification services in Hong Kong:

1. Putting in place institutional measures to support adoption of PCF accounting by end users, for example, enhancing the availability of PCF services through supporting related training on the latest knowledge and industry-specific schemes.

2. Enhancing awareness-raising and the promotion of PCF accounting to key stakeholders, in particular retailers of consumer goods, buyers, manufacturers and raw materials suppliers.

3. Exploring the incorporation of carbon footprint elements in procurement policies of organizations. Subject to the final plan to be adopted by these organizations, more market demand for related T&C services would in turn be stimulated.

BIODEGRADABLE PLASTIC BAGS

Degradable Materials Testing and Certification

> "Biodegradable plastics may replace about 90% of traditional petroleum plastics in the future"
>
> (European Bioplastics)

According to the Environmental Protection Department (EPD), Hong Kong will run out of landfill space by 2019 if waste production continues to increase at its current level.[51] Unless solutions are identified immediately, Hong Kong may face an imminent crisis of having "nowhere to put" the thousands of tonnes of waste thrown away each day. With plans to establish advanced incineration technology and expand the existing landfills currently on hold, the use of degradable plastic materials is one possible solution that may alleviate pressure on Hong Kong's landfills, in view of the fact that plastic bags constituted a significant 8.2% of municipal solid waste in 2012.[52]

The degradability of a particular plastic material depends on what it is made from. Generally speaking, plastic materials can be classified into two categories: petroleum-based traditional plastics and bioplastics.

Petroleum-based plastics such as Polyethylene (PE), Polypropylene (PP), Polystyrene (PS) and Polyvinylchloride (PVC) are not degradable in accordance with internationally-recognized testing standards. However, there are oxidative additives that can be added to traditional plastics to enhance their degradability.

On the other hand, bioplastics are produced from renewable sources such as corn starch and vegetable oils. Pure bioplastics are inherently degradable as they are produced from plant and animal sources. Polylactide acid (PLA), Polyhydroxyalkanoate (PHA), Polycaprolactone (PCL) and cellulosic esters are the most commonly used bioplastics on the market.

According to European Bioplastics (EP), biodegradable plastics may replace about 90 percent of traditional petroleum plastics in the future.[53] Global bioplastics production capacity

51 *Environment Bureau, Hong Kong Blueprint for Sustainable Use of Resources 2013-20122*

52 *Environmental Protection Department, Waste Statistics 2012*

53 *European Bioplastics, Bioplastics Facts and Figures, en.european-bioplastics.org*

is set to grow by 400 percent by 2017. It is anticipated that Asia Pacific will become the world's largest market for biodegradable plastics.

In Hong Kong, increasing environmental awareness has led to the use of degradable materials becoming a growing "green market trend". Recently, a new generation of plastic products, including bags and food containers, which claim to be "totally degradable" and "100% degradable", has made its way onto the market. Some of these claims, however, are not supported by any certification or results derived from robust laboratory testing. The extent to which degradation takes place in these products and the rate at which they degrade remains questionable.

On the other hand, some bioplastic products currently on the local market are generally blended with traditional resins to enhance their mechanical and physical performance. Some of these so-called "biodegradable" bioplastic products have been tested and found to not be genuinely degradable in accordance with EPD standards, as revealed in a test study by the Consumer Council.[54] Such fallacious claims may lead to these products risking infringement of the Trade Descriptions Ordinance of Hong Kong.

To allow consumers to make truly environmentally-conscious choices, while at the same time allowing the healthy development of the degradable plastic industry; there is a need to develop specific criteria and associated methods to test the degradability performance of these emerging plastic products. In addition, there is also a need to introduce a more creditable certification scheme that is accepted by the public.

54 *Consumer Council, http://www.consumer.org.hk/website/ws_en/news/press_releases/p301.html*

Plastic materials are used in various industries, therefore the establishment of a relevant T&C system for degradable plastic materials can raise the credibility of a wide range of products which contain plastics, both in Hong Kong and in other countries in which these products are marketed.

Regarding the availability of associated testing services, the Materials Laboratory of the HKPC is the only laboratory in Hong Kong to receive the Hong Kong Laboratory Accreditation Scheme (HOKLAS) certification for testing degradable PE/PP films in accordance with ASTM D 3826. Testing facilities are also available overseas, but the cost is three to ten times more expensive. With the market for degradable plastic products growing fast, there is a need to establish a greater number of associated testing facilities in Hong Kong.

Technical notes on degradable materials

Degradable materials are classified into several subdivisions, namely:

- Photo-degradable;
- Oxo-degradable;
- Hydro-degradable;
- Biodegradable;
- Oxo-biodegradable; and
- Compostable

There are a series of international tests related to degradable materials – such as ASTM, EN, GB and JIS standards; while Hong Kong uses the HS 2001 standard for testing degradable food containers. The most commonly used testing methods are:

- ASTM D 3826 Tensile Test Degradation End Point in Degradable Polyethylene and Polypropylene
- ASTM D 6954 Standard Guide for Exposing and Testing Plastics that Degrade in the Environment by a Combination of Oxidation and Biodegradation
- EN 13432 Packaging. Requirements for packaging recoverable through composting and biodegradation. Test scheme and evaluation criteria for the final acceptance of packaging
- HS 2001 Testing Guideline on the Degradability of Containers and Bags (HK, EPD standard established with the assistance of HKPC)

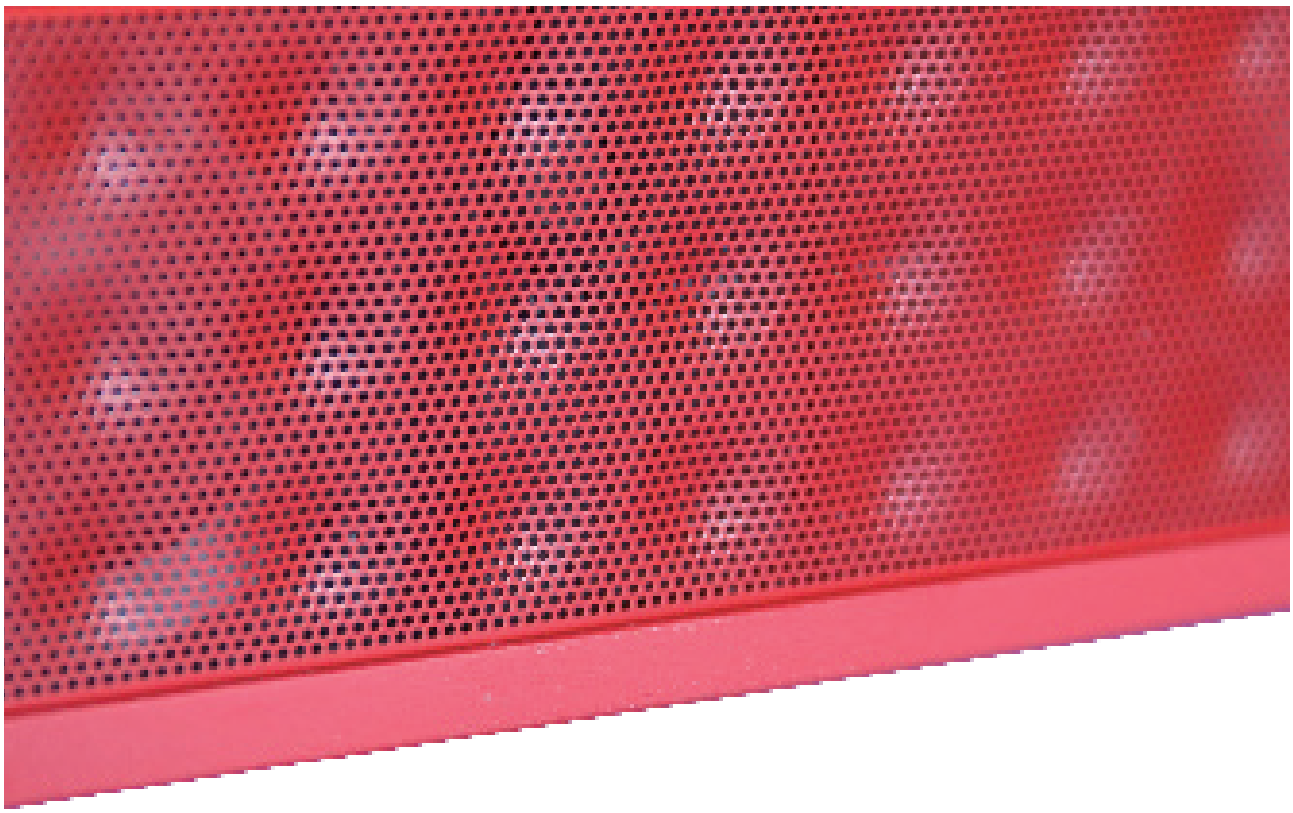
There is only one accredited degradability test in Hong Kong. It is on the PE/PP film in accordance with ASTM D3826.

We recommend the following measures to accelerate the development of degradable materials T&C services in Hong Kong:

1. Exploring the feasibility of establishing advanced laboratory testing services targeting degradable materials in Hong Kong.

2. Investigating the feasibility of introducing a certification scheme, with recognized accreditation by HKAS, for degradable plastic products. Such a scheme would help differentiate products with differing degradability performance. It would also allow consumers to make informed choices and select products which meet more stringent requirements.

3. Developing specific training programmes for professionals, so that T&C practitioners are equipped with the relevant knowledge and skills in degradable materials T&C.



T&C for Thought

Acoustic Equipment Testing

Speakers and headphones are now ubiquitous electronic gadgets in everyday life. In this digital era, the audio formats adopted by acoustic equipment makers have been evolving drastically. Over the past 15 years, the MP3 format – which is extremely convenient yet which has compromised quality – has shifted how music is accessed and enjoyed.

As a result of continuous improvements in digital coding and communication technologies, a more advanced format called High Resolution Audio has recently made its debut on the market. This technology allows consumers to listen to their digital recordings at levels of quality which the artists, producers and engineers originally intended the recordings to be heard.

Correspondingly, there is a rapidly growing consumer demand for high-quality acoustic equipment, similar to the demand for high-quality visual equipment associated with Ultra HDTV or 8k TV.

Audio products are also moving towards becoming wireless while maintaining this high quality audio output. At the 2014 Consumer Electronics Show (CES),[55] the Wireless Speaker and Audio Association (WiSA) promoted a high quality wireless transmission standard that ensures interoperability between devices and supports up to 7.1 channels at a resolution of 24Bit/96kHz.

In view of the ever-changing market for high resolution audio equipment, Hong Kong's audio equipment manufacturers need to be prepared in order to continue to operate in this highly competitive business environment. City University of Hong Kong established an acoustics centre[56] in 2013 to spearhead acoustic engineering research, including laboratory facilities and high quality audio equipment.

The T&C industry may wish to investigate the possibility of setting up an effective and representative audio quality T&C scheme to objectively categorize the audio performance of speakers and earphones on the market. Not only will this create a benchmarking platform for manufacturers, it may also assist consumers in differentiating between high resolution audio products with varying audio performance. The industry may also wish to consider the opportunity of developing testing services to help manufacturers meet requirements set out by WiSA or similar associations.

55 *CES Show Report http://hometheaterreview.com/2014-ces-show-report-and-photo-slideshow/?page=2*

56 *CityU-KEF Acoustics Centre http://wikisites.cityu.edu.hk/sites/media/pr/Pages/2013100300.aspx*

SUMMARY

With a growing proportion of people leading resource-intensive lifestyles, our demand for natural resources is more intense than ever before. To address the emerging challenge of scarce resources, businesses are introducing products or services that are more sustainable, while sustainability-related product claims are becoming more prevalent.

T&C plays a vital role in allowing consumers to differentiate between products and make truly environmentally-conscious choices, while at the same time underpinning the development of the industry during its journey towards sustainability.

For example, **Product Carbon Footprint (PCF) Labelling** and **Certification of Bio-degradable Materials** are among some of the new product labelling trends which will become better-known by consumers, and for which T&C services will soon be needed.

Hong Kong enjoys a competitive advantage in terms of developing related T&C services for the trend of product sustainability, due to:

- Our internationally-recognized validation and certification services;
- Our high level of professional integrity and technical competence in sustainability-related T&C; and
- Strong consumer awareness and corporate support to attain a greater level of sustainability.

We recommend the following measures to accelerate the development of product sustainability T&C services in Hong Kong:

- Strengthening the capacity-building efforts of industry practitioners through offering more practical training and case studies of application excellence; and
- Making the business advantages of using product sustainability standards and testing or certification more prominent, in order to drive the wider application of T&C services in the commercial sector.

Chapter 5

Green Transport:

Driving New Testing and Certification Opportunities

About the Trend

With the twin concerns of energy independence and the environmental protection becoming prevalent around the world, both the public and private sectors have started to see the need for a sustainable or "green" transportation system. A number of countries have already established a clear policy framework to accelerate the development and adaptation of green vehicle technology: electric vehicles (EVs), hydrogen fuel-cell vehicles and other alternative fuel vehicles (AFVs), for example. In view of the Government's measures to promote the use of EV and a wider availability of EV models currently in Hong Kong, this study will focus on EV and its associated T&C opportunities.

Internationally, due to tightening emissions requirements and the fuel economy legislation enacted by various governments, automakers have increased their green technology development efforts and pumped out a virtual flood of "green" models – from sedans to buses – to meet market demand. According to recent data from HIS Technology,[57] EV production has grown at an annual rate of 66 percent on average in the past three years, and is expected to increase by a further 67 percent and exceed 400,000 units in 2014.

For example, the United States government recently strengthened restrictions on emissions and introduced a series of initiatives including a designated grant of US$3 billion (approx. HK$23 billion) for vehicle development; a national vehicle demonstration program to increase public awareness, and tax incentives and benefits of up to US$7,500 (approx. HK$58,500) for plug-in EVs and US$3,000 (approx. HK$23,400) for hybrid vehicles. By 2013, there were more than 11 million AFVs, 3 million hybrid vehicles and 1 million EVs (including New Energy Vehicles (NEVs) and hybrids) on the market, making US the world leader in green vehicle sales.

China, both the world's largest manufacturer of and market for automobiles, has taken the lead in green vehicle development; aiming to not only upgrade the industry but to also reduce environmental pollution and fuel consumption. To realize these goals, the government established the Automotive Industry Adjustment and Stimulus Plan (2009-2011)[58] to guide the development focus for green vehicles. The government also promoted an EV demonstration programme in 13 cities (later expanded to 25 cities), with a target of providing more than 1,000 EVs in each city. In addition,

57 *Global Production of Electric Vehicles to Surge 67 Percent This Year, by B. Scott, HIS Technology, http://technology.ihs.com/491852/global-production-of-electric-vehicles-to-surge-67-percent-this-year*

58 *Automotive Industry Adjustment & Stimulus Plan (2009-2011), http://www.gov.cn/zwgk/2009-03/20/content_1264324.htm*

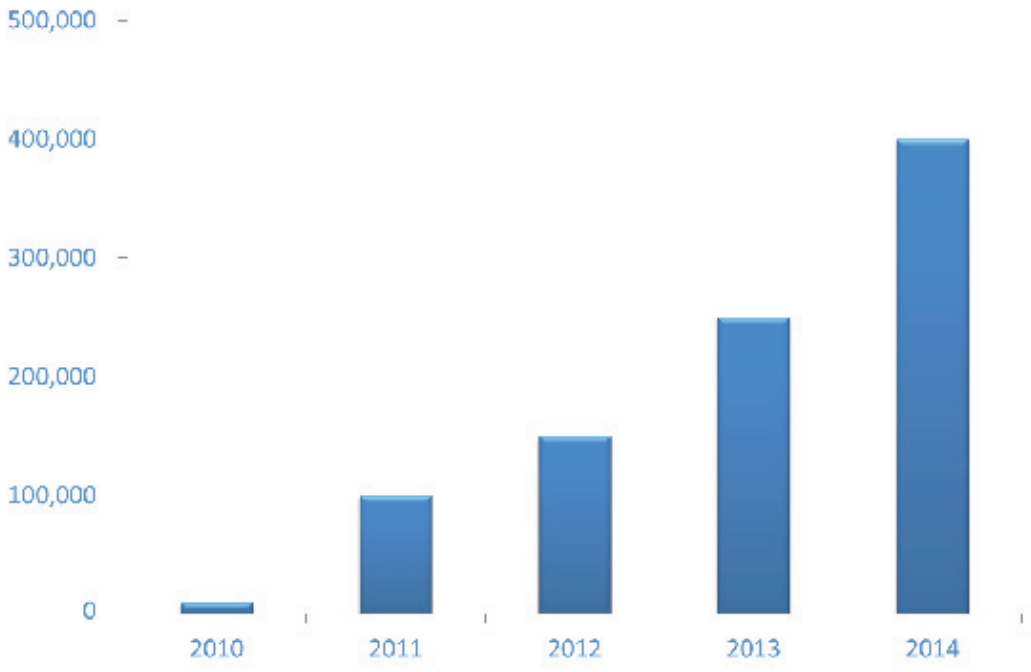


Figure 5.1 Global Electric Vehicle Production & Forecasts (include Plug-in Hybrid)

the Energy Saving and New Energy Vehicle (NEV) Industry Development Plan (2011-2020)[59] allocates financial resources and tax benefits to support green vehicle consumption and production, aiming to reach an accumulative NEV production and sales figure of 5 million units by 2020. An annual subsidy of CNY 10-20 billion (approx. HK$12–25 billion) was also announced by the Ministry of Finance, which has been invested in R&D for energy saving and new energy vehicles beginning in 2012.[60] In Beijing alone, the deployment of approximately 170,000 NEVs is planned between 2014 and 2017.[61]

In ***Hong Kong***, the HKSAR government has also developed a policy for green vehicle adoption and encourages the private sector to take an active role in green transport. With close to 600 EVs currently on the road, and given the recent developments in EVs and infrastructure, Hong Kong would be the perfect trial for a "green transport city", given its unique geographical characteristics and demographics.[62]

"EV production has grown at an annual rate of 66% in the past 3 years, and is expected to increase by a further 67% in 2014"

(HIS Technology)

59 *Energy Saving and New Energy Vehicle (NEV) Industry Development Plan (2011-2020),* http://www.nea.gov.cn/2012-07/10/c_131705726.htm

60 http://dgnz.dg.gov.cn/Dynamic/view.asp?sn=bQRAad

61 http://www.wcn.com.hk/content/2014-02/28/content_824144.html

62 *Environmental Protection Department,* http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/promotion_ev.html

Why T&C Matters

As the automobile industry is highly regulated by governments yet run by automakers, the T&C of vehicles and components for compliance is an essential step in the vehicle development process.

Green vehicles are the new "frontier" of the traditional auto industry, using sophisticated technology to create environmentally-friendly solutions. T&C can play an important role in the development of a new generation of vehicles.

Proper information labels are important to consumers, allowing people to make informed decisions when selecting green vehicles. For example, fuel economy labels provide valuable data on a vehicle's estimated range and fuel consumption based on standard drive cycles. These are measured under controlled conditions in a laboratory using standardized test procedures specified by law. A label is based on defined drive cycles or other variables and varies by individual country. The United States, Japan, and China each have their own vehicle labelling procedures and require labels to be applied to vehicles before they can be sold to end consumers.

Besides demonstrating environmental performance, green vehicles must also meet a set of functional and safety requirements, similar to traditional vehicles, before they are put on the road. For instance, electric vehicles require due consideration to be paid to high voltage safety issues, while vehicles using biodiesel must meet certain fuel standards.

Growth Drivers

In general, the T&C demands associated with green transport can be categorized as follows:

Access to International Markets

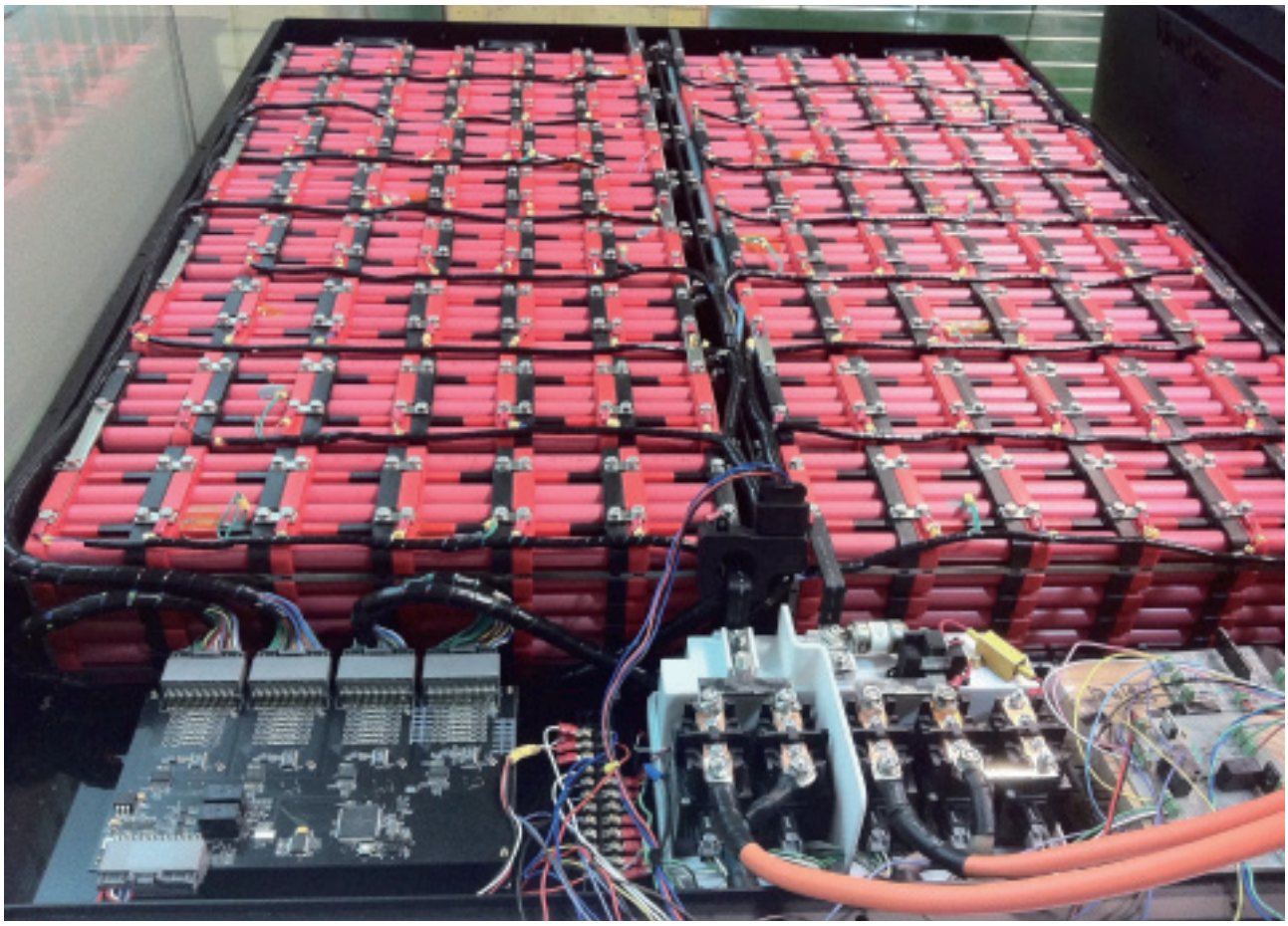
Before a product can be placed on the market, it must meet various regulatory requirements imposed by governments or legal bodies. Variations between different countries or regions create additional opportunities for T&C specialists to help automakers fulfill the regulatory requirements for their target markets. Vehicle operation, occupant safety, emissions production and fuel economy are general aspects of consideration in this area.

Benchmarking with Best Practices

Green transport can benefit from the automotive industry's rich – over a-century-long – experience. Industry standards cover various aspects of vehicle production, the main ones being International Organization for Standardization (ISO) standards, SAE International (SAE) standards, United Nations Economic Commission for Europe (UN/ECE) standards, and Electromagnetic Compatibility (EMC) standards. However, with the added complexity inherent in green vehicle technology, new standards and testing methodologies will be required to meet these emerging challenges.

Meeting Supply Chain Requirements

Leading automakers usually develop their own knowledge base. This knowledge is then transformed into corporate policy and specifications which are then passed along the supply chain. As suppliers strive to meet these new specifications, T&C services allow them to ensure qualitative compliance.



T&C for Thought

EV Batteries and Charging Equipment Testing

As the powerhouse of electric vehicles, batteries are not only a key piece of equipment that must pass applicable safety and performance assessments; they are also crucial to the overall energy efficiency of the vehicle. Providing an enhanced energy storage capacity, lithium batteries used in EVs are significantly different from those used in consumer electronics or in "stationary" technology. Generally speaking, in order to assure a high level of safety, quality and reliability performance, lithium batteries have to pass a range of safety tests and comply with applicable standards such as those listed below.

EV charging stations or charging points are devices that recharge EV batteries with electricity, just as fuel pumps fill up vehicles' fuel tanks. In Hong Kong, around 1,000 standard EV charging points and 10 fast charging stations are now in place.[63] In general, fast charging equipment requires live power and high current to function. The design of this equipment and how it conducts communication with EV need to comply with a set of international standards and requirements to prevent hazards to vehicle batteries and reduce risks to vehicle operators.

At present, there are 25 EV models from 7 countries type-approved by the Transport Department (TD) and available for sale in Hong Kong, including 15 models for private cars and motorcycles, 10 models for public transport and commercial use. As electric vehicle ownership has begun to expand rapidly in Hong Kong (592 currently in

63 *Environmental Protection Department, http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/promotion_ev.html*

Safety Test	
Battery safety	Overcharge
	Over discharge
	Short circuit
	Impact
	Transportation test
Reliability and Abuse Test	
Thermal	Temperature cycle
	Thermal shock
	High temperature endurance and thermal stability
Mechanical	Vibration
	Mechanical shock
	Drop test

Table 5.1 Safety test items for lithium batteries for electric vehicles

use, up from 74 in end 2010 and 242 in end 2011), the development of and demand for charging equipment and charging station is also beginning to grow.[64] The Government has recently announced its plan to launch a trial scheme to allow suppliers of electric taxis to set up quick chargers at car parks administrated by TD. Meanwhile, 100 medium chargers will be installed in different districts to shorten EV charging time.[65]

To better support the increasing number of EV users in Hong Kong and facilitate the future surveillance in the market, it would be helpful to develop local testing service capacity in aspects such as:

- Benchmarking and comparison testing to address the issue of compatibility due to various international standards, local driving modes or even cross-border travelling needs;
- Operation simulation and impact verification in the local environment;
- Testing compliance to battery transportation requirements, such as UN38.3 and IEC 62228; and
- Electromagnetic Compatibility (EMC) validation of batteries, battery management systems (BMS), and charging equipment.

64 *Environmental Protection Department, http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/promotion_ev.html*

65 *2014 Policy Address by Chief Executive, http://www.info.gov.hk/gia/general/201401/15/P201401150310.htm*

Fuel Economy and Energy Performance Labelling

When consumers select a plug-in hybrid vehicle or electric vehicle, travel range is often one of the factors given greatest consideration. In recognition of this key concern, comparable fuel economy and energy performance labels can be used to supply the relevant information of green vehicles in a visual way, such as:

- Fuel economy;
- Travel range per charge;
- Kwh/100km; and
- Level of energy saving.

In the United States, the Environmental Protection Agency (EPA) is the authority to oversee the fuel economy and energy labelling scheme. EPA recently revised the scheme to include plug-in hybrid vehicles and EVs.[66] Authorized automakers can "self-certify" by following defined test procedures from the EPA and by submitting all test data to the national lab for verification. The national lab also conducts tests on sampled vehicles to verify the submitted information.

The climate and geographical conditions in Hong Kong can deviate significantly from other countries or regions, leading to different local driving modes and affecting vehicles' fuel economy or energy performance. For example, air conditioning systems are a significant factor – one which can greatly affect a vehicle's energy usage – due to the prevailing warm and humid weather. Hence, locally-specific fuel economy and energy performance data would be valuable for local customers to make an informed decision.

In contrast to the extensive standards which exist for gasoline vehicles covering safety, reliability and other aspects; there are few testing standards for green vehicle fuel economy and energy performance rating at the moment. Due to the unique drive cycles applicable to vehicles in Hong Kong, there could be a rising need in the future to establish corresponding local test procedures or requirements, developed in reference to existing international standards developed in areas such as the European Union, Japan, the United States, and China.

66 *United States Agency, http://www.epa.gov/carlabel/index.htm*

SUMMARY

In view of the strong growth rate and ready adoption of green transport around the world, including Mainland China, both automakers and users of this new generation of vehicles face significant technical and habitual changes.

T&C can play a vital role in supporting the development trend of green transport.

There are a number of potential development areas for the local T&C industry, including **EV Batteries and Charging Equipment and Fuel Economy** and **Energy Performance** which will support the healthy growth of the industry and help safeguard the public.

Hong Kong enjoys a competitive advantage in terms of developing related T&C services for the green transport trend, due to:

- National and local government policies which support green transport;
- Strong driving forces from both public and private sectors;
- Our ability to access knowledge in both the domestic and overseas markets with little language or cultural barriers; and
- Our strong technical competence and professional integrity.

We recommend the following measures to accelerate the development of green transport T&C services in Hong Kong:

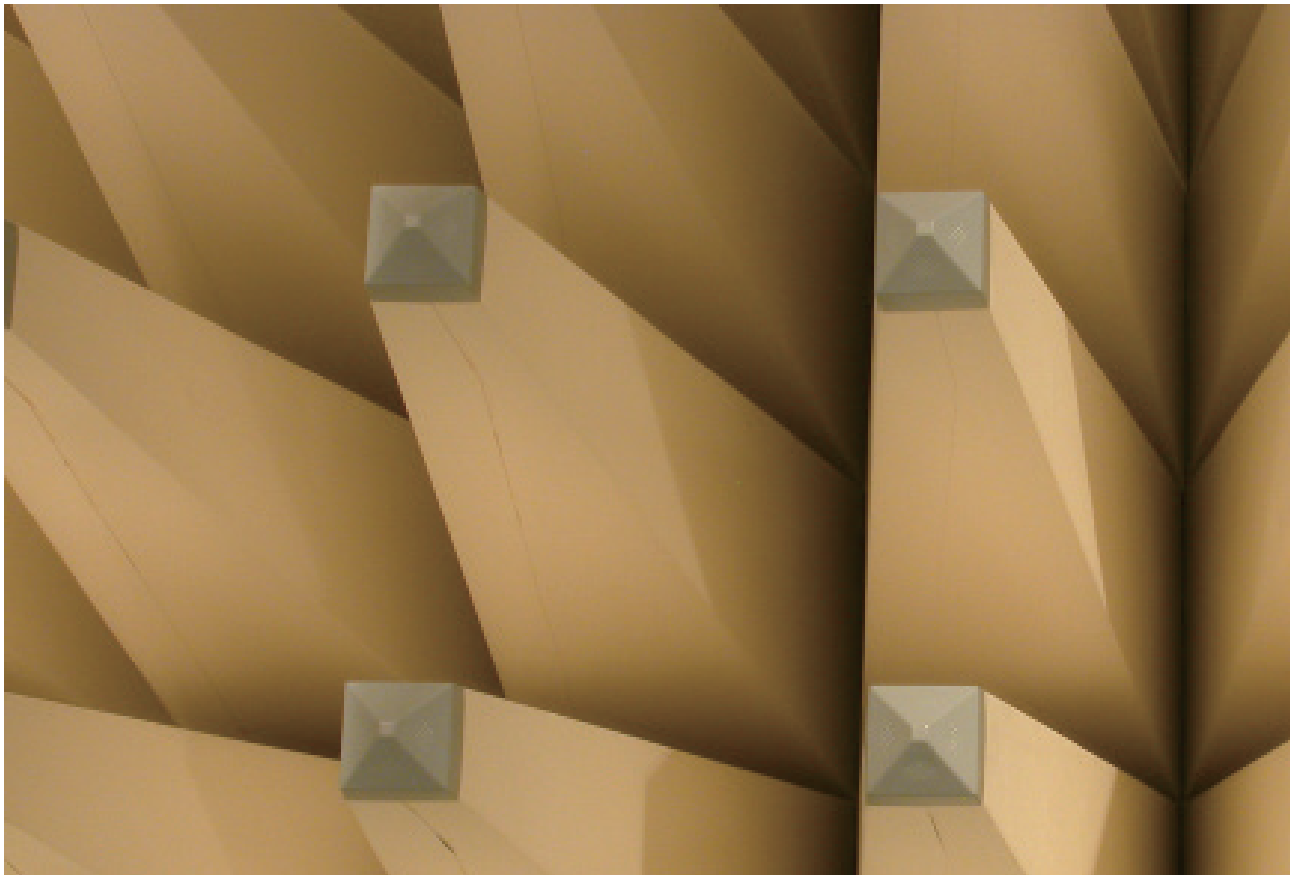
- Conducting a study on the existing international T&C requirements related to green transport, aiming to identify focus areas for business development for local T&C industries; as well as the potential for localization of certain requirements; and
- Encouraging knowledge exchanges with international T&C service providers to develop local T&C capacity related to green transport.

Chapter 6

Empowering the Hong Kong Testing and Certification Industry

Over and above the efforts made by the Hong Kong SAR Government to aid the development of the T&C industry, further support and business opportunities may be created by building synergy with local research and educational institutions and by establishing T&C industry partnership with other sectors. Such synergy and cooperation will fuel the overall development of Hong Kong's T&C capacity. This study has identified two feasible strategies to speed up the growth of the T&C industry:

- Strengthening business development; and
- Enhancing professional development.



Strengthening Business Development

As part of the Government's initiatives, different funding schemes, such as the Innovation and Technology Fund (ITF) and the Research and Development (R&D) Cash Rebate Scheme, are now available to local T&C service providers to help them build business capacity. A total funding amount of nearly HK$20 million has been granted to support research and development of new testing technologies.[67] A range of promotional approaches, including seminars, forums, trade fairs are also available to T&C service providers for enriching their business opportunities.

In addition to the above initiatives, the following three focus areas can be further strengthened to help enhance the medium- to long-term business development of local T&C industry:

Building Joint Expertise Among Testing Facilities of Local Institutions

In Hong Kong, there are a number of research and educational institutions which specialize in various aspects of technical expertise and provide a variety of testing facilities. These facilities provide T&C services related to quality, reliability, mechanical, electronic, material selection, and other areas. Their test results help companies identify the root causes of technical issues at different stages of a product's lifecycle and prevent potential hazards to users or to the environment.

Although the existing testing facilities of local institutions help companies with a single issue or few separate issues, none of them can provide a "one-stop" solution to different "syndromes" that a product may encounter. For example, a smart watch manufacturer may find issues with water resistance, wireless connectivity, anti-scratch, PCB assembly process and reliability; and thus have to consult many different specialists to solve all these problems. To support companies in shortening product development and root cause analysis timelines, it is desirable to establish one single channel which can provide a multitude of testing and technical support services to local industries under one roof.

The Lab Test One, a new initiative jointly launched in 2013 by the Hong Kong Productivity Council (HKPC) and the Hong Kong Science and Technology Parks Corporation (HKSTPC), allows

67 *LC paper No. CB(1)290/13-14(05) Progress Report of the HKCTC (2013) http://www.legco.gov.hk/yr13-14/english/panels/ci/papers/ci1119cb1-290-6-e.pdf*

enterprises to take full advantage of the wide range of state-of-the-art testing facilities and professional support services offered by these two institutions. By provision of shared testing facilities, the initiative was found to be useful to laboratories in the T&C industry in saving capital investment.

To further enhance the scope and capacity of providing T&C services through a single channel, we recommend extending the partnership to include more local R&D centres, testing facilities of universities and non-governmental organizations. In view of the growth in market demand and the implementation of the Mainland and Hong Kong Closer Economic Partnership Arrangement (CEPA), local T&C service providers may make use of the resources and knowledge from the single channel to strengthen their capability to provide additional T&C services, such as testing for the China Compulsory Certification (CCC) System.

"By provision of shared testing facilities, Lab Test One was found to be useful to laboratories in the T&C industry in saving capital investment"

Extending Business Network Across Sectors and Regions

To enhance the growth of Hong Kong's T&C industry, seminars, forums and publications are organized on a regular basis to disseminate relevant information and promote services to various parties. The current approach focuses mainly on the exchange of experience and the dissemination of information.

We recommend arranging regular business matching or networking sessions for the T&C industry to reach out to other sectors. These sessions can serve as an open platform to engage T&C service providers and potential users in direct and effective exchanges of information, and serve as a source of new inspiration by connecting parties across different sectors, including those that may have limited exposure to each other. It is expected that through this kind of open platform, service providers and industry users may explore new opportunities for cooperation

> **"We recommend the local T&C industry to strengthen their business relationships with peers and users on the Mainland"**

and perhaps establish long-term business partnerships.

The government has been promoting the cooperation between the Mainland and Hong Kong on T&C through various channels, including CEPA. According to the Supplement VII to CEPA, the Mainland has been gradually opening up its market to Hong Kong testing organizations. Several Hong Kong testing organizations have also reached agreement with Mainland certification bodies to undertake testing under CCC for products processed in Hong Kong.

With trade continuing to be liberalized under CEPA, more and more business opportunities in the Mainland are being presented to Hong Kong's T&C industry. To accelerate cross-border collaboration on T&C services between Guangdong and Hong Kong, we recommend that the local T&C industry proactively explores opportunities to strengthen their business relationships with peers and users on the Mainland, and jointly identifies ways to achieve sustainable growth of the T&C industry in the two regions.

Providing Incentives and Recognition

Despite the fact that third-party certification can provide added value and commercial advantages to companies, the extra cost of certification and the intensive manpower involved often deters companies from seeking newly launched certification schemes.

In Hong Kong, there are a number of government funding schemes which provide support to encourage the use of T&C services. For example, the Innovation and Technology Fund (ITF) encourages enterprises in developing new T&C technology, whereas the SME Development Fund (SDF) offers funding support

to SMEs in applying new T&C services.

We recommend assessing the potentials to enhance these existing funding schemes and make them prominent to the public so that companies, especially the SMEs, can utilize T&C services to seek and achieve newly launched certifications accredited under the Hong Kong Certification Body Accreditation Scheme (HKCAS). The impact is expected to be long-term, since companies will increase their market competitiveness through T&C services and likely renew their certification after the initial cycle. Meanwhile, local T&C service providers will also gain access to a broader range of business opportunities.

In addition to economic incentives, recognition in the form of a standardization and compliance excellence award scheme could be employed to motivate companies that have demonstrated effective use of standards, testing and certification to create tangible business advantages. By showcasing the best practices of the industries and encouraging high standards of performance, effective utilization of T&C services would also be promoted. Such an award scheme has already been implemented in Taiwan to inspire organizations to set up and carry out standardization since 2000.[68] The award scheme commends organizations or individuals that actively put standardization into practice. To date, 96 organizations have been recognized through the scheme.

To provide formal recognition to successful T&C applications, we recommend evaluating the possibility of establishing a standardization and compliance excellence award scheme with the support of local trade associations in Hong Kong. The scheme may target local organizations that have adopted standards or testing services and actively sought to obtain certifications to support their business operations, with special consideration given to SMEs that may require more incentive to invest resources for certification. By making the associated business advantages more prominent, other corporations would realize the benefits from achieving standardization and compliance excellence, which in turn bringing a wider adoption of T&C services.

68 http://www.std.org.tw/webDocument.asp?DocuNo=09600003

Enhancing Professional Development

In recent years, the Government has committed to both recruiting "fresh blood" to the T&C industry and enhancing the skills of existing practitioners. Learning programmes and courses geared towards nurturing future talent have been arranged by different organizations, including the Vocational Training Council (VTC) and local universities. Technical seminars and short courses have also been arranged for existing practitioners to enhance their professionalism and capabilities.

Under the New Technology Training Scheme (NTTS), practitioners can obtain funding support to attend training in new technology pertinent to their business. Furthermore, under the Qualifications Framework (QF) being introduced for the T&C industry, the Specification of Competency Standards (SCS) is under development, aiming to map out the development pathways along which practitioners can progress along their career ladders.[69]

While the industry has responded positively and welcomed these initiatives, there are concerns about whether existing initiatives for practitioners will be able to cope with the growing demands from the market. These demands, which range from more overseas exposure to expanded support for new T&C services, have yet to be addressed. In view of the above, the enhancement of T&C professional development could focus on the following three areas:

69 *Qualifications Framework: Testing, Inspection & Certification:* http://www.hkqf.gov.hk/ind/en/tic.asp

Developing T&C Professionalism through Maximizing the Support of Existing Training Assistance Platforms

At present, local employers wishing to acquire new technology for commercial applications and persons sponsored by their employers to attend relevant training sessions are able to apply for sponsorship and receive certain training grants, such as the NTTS scheme. In 2010-2011, T&C-related subjects such as ISO 14064 Carbon Auditor Training were listed among the top ten NTTS-subsidized training courses.

We recommend seeking ways to raise the profile and maximizing the support of the existing training assistance schemes in order to suit the evolving training needs of T&C practitioners. For example, to identify funding opportunities within the existing schemes' structure to assist practitioners to attend local or overseas training courses and conferences which are related to new T&C content yet to be widely applied in Hong Kong. Furthermore, funding support could be given for courses and conferences that are in line with the Qualifications Framework and the Specification of Competency Standards to facilitate professionalism development within the T&C industry.

Encouraging Practitioners' Participation in the Development of International Standards

The development of new international standards is crucial to the industry, as this introduces new solutions to meet the industry's emerging needs. New international standards are usually developed by technical committees from different organizations such as the ISO (International Organization for Standardization) and the IEC (International Electrotechnical Commission). These committees are made up of qualified representatives from industry stakeholders such as research institutes, government authorities, consumer bodies and international organizations.

In Hong Kong, the Product Standards Information Bureau (PSIB), under the Innovation and Technology Commission (ITC) is the authorized representative which encourages interested parties to take part in standards development. The PSIB also represents Hong Kong in different international standards organizations.

We recommend seeking opportunities to facilitate and encourage T&C practitioners to participate in the development of international standardization. One of these opportunities would be to assist T&C practitioners to participate in meetings and processes for the international standards development. Industry consultation meetings regarding standards localization may also be covered if found to be appropriate. Hong Kong could also play a more active role in exploring the possibility to host international seminars and conferences with regard to standardization, in order to enhance the participation of local T&C industry in the global T&C industry development.

Establishing a One-stop Centralized Knowledge Transfer Platform for T&C Practitioners

HKCTC, HKAS and other Government departments and public bodies have been actively organizing learning and technical events at which T&C practitioners can enhance their capabilities and absorb new skills. Between 2009 and 2013, over 260 technical seminars and training events have been delivered by the aforementioned organizations.[70] While there are numerous types of events organized in various locations, a one-stop centralized knowledge transfer focal point would be helpful to allow T&C practitioners to benefit from knowledge accumulated through different channels.

In view of the above, we recommend exploring the feasibility of establishing a one-stop centralized platform which helps practitioners conveniently acquire the necessary knowledge and skills to carry out T&C services. The capacity of this knowledge transfer platform could also be further enhanced by leveraging resources and through the joint efforts of different research, training and educational institutions in Hong Kong.

70 *LC paper No. CB(1)290/13-14(05) Progress Report of the HKCTC (2013), http://www.legco.gov.hk/yr13-14/english/panels/ci/papers/ci1119cb1-290-6-e.pdf*

In order to empower the Hong Kong T&C Industry,

WE RECOMMEND…

- ***Strengthening business development*** *by:*

  i. **Building joint expertise among testing facilities of local institutions** to further enhance the scope of T&C service capacity and provide a "one-stop shop" solution for the industries;

  ii. **Extending business network across sectors and regions** by arranging periodic business matching or networking sessions in Hong Kong as well as exploring opportunities to strengthen their business relationships with peers and users on the Mainland, and identify ways to achieve sustainable growth of the T&C industry in the two regions; and

  iii. **Providing incentives and recognition** which directly benefit businesses that actively achieve newly-launched certifications and utilize T&C to gain market competitiveness; by offering both economic incentives and high-profile recognitions such as an award scheme.

WE ALSO RECOMMEND ….

- ***Enhancing professional development*** *by:*

  i. **Developing T&C professionalism through maximizing the support of existing training assistance platforms** to suit the evolving needs of T&C practitioners;

  ii. **Encouraging practitioners' participation in the development of international standards** through support schemes, as well as exploring the possibility to host international seminars and conferences with regard to standardization in Hong Kong; and

  iii. **Establishing a one-stop centralized knowledge transfer platform** for T&C practitioners to synergize benefits from knowledge accumulated through different channels and a range of local institutions.

Disclaimer

The materials contained in the report are for information purpose only. HKPC endeavours to provide accurate, updated and timely information, there can be no guarantee that such information will continue to be accurate in the future. HKPC cannot accept responsibility for any damage or claim resulting from use of the information in the report.

External materials quoted in the report do not reflect the views of HKPC, nor endorsement by HKPC of the opinions expressed in them.

Publication name

Insights - Study Report on Opportunities for Hong Kong's Testing and Certification Industry

Publication date

October 2014

Publisher

Hong Kong Productivity Council (HKPC)

HKPC is a multi-disciplinary organization established by statute in 1967. HKPC's mission is to promote productivity excellence through the provision of integrated support across the value chain of Hong Kong firms, in order to achieve a more effective utilization of resources, to enhance the value-added content of products and services, and to increase international competitiveness.

HKPC
Hong Kong
Productivity Council
香港生產力促進局