CBI Trends:

Electronics and Electrical Engineering
**Introduction**

Exporters from developing countries (DCs) will see opportunities through cooperation and knowledge sharing with experts from mature markets, such as Europe, Japan and North America, and will be able to strengthen their position through co-development of innovative product solutions. A focus on niche markets and penetration of electronics in new markets such as automotive or e-vehicles, automation, electronic lighting and energy will be advantageous for DC exporters. Technological, environmental and political trends will create a surge in demand for smart, efficient solutions, opening doors for innovative electronics suppliers. Finally, specialisation in components and solutions for niche segments to meet the needs of older people is another opportunity for developing countries, while the changing socio-demographic composition in Europe welcomes innovative products in the healthcare industry and new solutions for households.

*Figure 1: Opportunities for developing country exporters in Electronics & Electrical Engineering (E&EE) Sector*

**Social Market Trends and Opportunities**

1. **Changing socio-demographic composition will create opportunities in new and niche markets:**

   *Urbanisation, an ageing society and changing human behaviour will continue to impact consumer preferences and demands, welcoming new products and solutions in innovation-rich application industries, as well as in niche segments.*

   In the long term, the growth of urban areas will continue to drive the need for technical solutions for people, accommodation and transportation. A focus on sustainability in Mega Cities will strengthen the importance of electric transportation in Europe, USA and Asia and this, in turn, will increase the demand for electronic solutions in numerous industries;

   **Tip:**
   - Actively participate in open innovation centres to learn about your opportunities in the current market directions. Establish strategic alliances with European peers to co-develop new solutions;

   Changing human behaviour and attitudes towards car ownership will drive the demand for different solutions such as small or economical cars, thus re-thinking the role of mobility vs. a simple car-possession attitude. Ultra-low-cost vehicles supplied by Chinese and Indian original equipment manufacturers (OEMs) will be increasingly placed on the European market;
A demographic shift to an ageing society will set new needs in industry, logistics, households, and will create new markets for electronics. In the short and the long term, the integration of new technologies such as digital infrastructure and combined solutions in the healthcare industry, as well as specialised solutions for households will be in demand. Electronic component suppliers should start specialising in niche components targeting the needs of older people.

Technological Market Trends and Opportunities

1. The demand for integrated and adapted electronics that fulfil safety and reliability requirements will increase:

The integration of networking possibilities into new applications, such as the use of internet applications in vehicles, will continue to increase the share of electronics in cars and other end-products. This development is known as the internet of things (IOT). Developing country exporters will be able to benefit from the demand for integrated electronics if they are flexible and capable of integrating new technological trends such as networking and if they assure high quality and safety of these products.

The connectivity trend and the penetration of the internet in various application industries will continue to drive the demand for integrated, complex, “connected” intelligent solutions in the short and the medium term. For example, intelligent electronic solutions will be increasingly integrated in the automotive industry, and intelligent solutions will continue to penetrate the energy sector for household solutions;

Tip:  
- Adapt your unique selling proposition to the needs of European OEM’s. Create integrated solutions, and customise electronic assemblies or finished products based on the client’s needs. Developing country exporters offering embedded software will benefit from easier customisation as opposed to hardware and from lower or no shipping costs;

Product safety will continue to be crucial, especially in the automotive industry. European OEM’s will be less loyal to branded only products, while product price and quality, as well as supplier reliability will be the key decision making factors;

Tip:  
- Meet the safety and quality demands by integrating a quality assurance programme in your production process.

Product customisation based on regional requirements will continue to play a significant role in some sectors such as the automotive industry. The share of electronic parts produced in the markets in which the end-product is to be sold will grow in the medium and long term, thus strengthening the position of developing country exporters.

Tip:  
- Partner with OEM’s who produce ultra-low-cost economical cars and consider expanding your product range for this specific application;

Tip:  
- Diversify or specialise your product offering in niche components that are in demand by older people, such as parts related to safety, comfort and special needs in households. Work on a specialised product offering for the healthcare industry.

Tip:  
- Depending on your resources and know-how, develop a product range targeting the ageing society. Look for possibilities to supply electronic components to companies specialising in e-health.
2. Increasing role of product innovation creates new markets for electronics and electrical engineering:

Opportunities for developing country exporters will grow along with the ongoing innovation process across all application industries. Innovation on the micro level and the penetration of electronics into new markets will open doors for new suppliers of electronics.

As the importance of innovation grows, new markets and application industries for electronics and electrical engineering will emerge. For example, electronic lighting, which is still mainly a replacement product for conventional lighting, will be increasingly integrated in total building lighting systems, building electronic security systems, light fittings and industrial lighting. Moreover, the growing share of electronics in vehicles and the ongoing shift to automation of production processes and services will continue to increase the demand for electronics in Europe (see consumption and production figures in Trade Statistics for Electronics and Electrical Engineering);

As the decision making process in Europe changes, European OEM’s will start thinking on a smaller scale, e.g. OEM-owned “micro” energy regeneration plants will create opportunities for smaller electronics suppliers in Europe.

European OEMs will start separating high-tech and low-tech, or high-price and low-price electronic product parts. For example, in the automotive industry, a split of hardware (low-price) and software (high-price) will occur as a result of retaining intellectual property rights, i.e. software development in-house, and purchasing hardware from developing country suppliers. RFID is another example of low-price and high-price product separation, where low-tech RFID for consumer industry application is sourced mainly overseas, while high-tech wide-range signal transmission solutions are mainly produced by European OEMs.

Macro-economic Market Trends and Opportunities

1. The opportunity for cooperation with developing countries grows, driven by the declining relevance of Europe, cost pressures and raw material scarcity:

While production costs in Europe are high, the need to balance available resources grows and the fast development of markets outside Europe defines global trends and market needs. The importance of cooperation between mature and emerging markets also expands as a result. Apart from cost advantages, developing country exporters will have the opportunity to introduce their own innovations to Europe.
In the short and medium term, high production costs in Europe are expected to intensify pressures on European manufacturers. They are losing their image as global technological leaders because of their higher product prices and because other manufacturers are catching up in technological know-how. Increasing labour and production costs in “technology rich” countries such as Germany, Switzerland, Finland, Sweden will drive production outsourcing to labour rich countries and will generate a shift to Engineering & Manufacturing Services (EMS) providers;

Tip:
- Developing country exporters will have cost advantages by offering labour intensive products, and will benefit from the ability to supply with better priced electronics. Analyse all your costs including production, marketing, logistics, insurance, and understand your liabilities and responsibilities. Analyse the product market price levels in the target country;

Another trend is near-shoring, the shift of production from high-cost states in Europe to lower-cost states in Eastern or Southern Europe, such as Poland and Hungary. Apart from costs, an additional advantage of this model is that the distance to the market is kept relatively low.

Tip:
- As the importance of emerging markets grows, developing country exporters will be able to introduce their own innovations in electronics. Establish strategic alliances in developing countries and in Europe, co-develop products with EU manufacturing by adding “local content”; offer electronics under the OEM brand names;

Europe has the share of only one fifth of the world market and demand. At the same time, emerging countries such as Brazil, China and India are experiencing extraordinarily fast development both in terms of production and consumption. In the long term, the relevance of Europe will continue to decline while the significance of emerging markets will grow. The demand and needs outside Europe will define the global market trends, driving the increasing importance of cooperation with emerging markets;

Tip:
- Establish partnerships in developing countries by splitting or complementing product range between partners. Get closer to the customer, by being visible on the internet, visiting trade exhibitions or considering opening a sales office in Europe.

As the problem of raw material scarcity intensifies and the value of earth commodities and materials grows, the need to balance country possibilities and available resources becomes stronger. In the long term, this will drive the expanding component-sourcing in commodity rich countries.

2. Developing country exporters can strengthen their positions through access to industryspecific information and the growing role of knowledge-sharing (Open Innovation):

The increasing product customisation based on regional requirements, adaptation of regional products to global demands, importance of transparency worldwide and the disappearing knowledge in some segments create opportunities for developing countries by strengthening the position of local manufacturers

The growing importance of cooperation drives two-way knowledge sharing between OEM’s in Europe and suppliers in developing countries, thus increasing the number of innovations across all application industries. With the growing role of emerging markets such as China, India, Brazil, innovations made in Europe will be customised in developing countries to adapt to regional requirements and to meet emerging needs outside Europe and be exported back to Europe. Product customisation based on specific regional characteristics is set to grow in the long term;

Tip:
- Product customisation by offering better or different product specifications or a customised design will be one of the key opportunities for developing country exporters. If you’re not able to offer big volumes like China can, look for niche markets through product customisation. Developing country exporters offering electronic components (e.g., wire wounds, cable harness, resistors, capacitors) will benefit from faster and easier production and customisation;

The role of cooperation between emerging (e.g. China, India, Brazil) and mature countries (e.g. Europe, Japan, US) will be driven by the need to apply the knowledge of emerging countries in Europe and in other mature countries. In the long
term, regional products will be adapted to global demands; European SME’s and OEM’s will start adapting and accepting innovations from developing country exporters. Manufacturers will be increasingly looking for new solutions in developing countries and applying them in Europe;

**Tip:**
- Talk about your innovations, use open innovation opportunities such as intelligence centres in order to introduce your innovations and ideas. You could also consider partnering with European OEM’s to adapt the existing solutions to European needs;

In the long term, expertise and innovation may migrate to emerging countries, as the level of education in developing countries improves through two-way knowledge-sharing between mature and emerging markets. The declining interest of talented people in engineering in Europe will result in a shortage of skilled personnel. Knowledge in some segments will disappear;

**Tip:**
- Learn from European suppliers to strengthen your expertise. Establish alliances with Universities and invest in the education of your workforce and in the improvement of their skills, as well as in the technological capacities;

In the long term, the growing demand for transparency and fair share of revenues will give developing countries access to global technological know-how; the position of developing country exporters will thus strengthen

**Tip:**
- Strengthen your supplier power by investing in know-how and R&D. Continue to diversify and be innovative in order to add value to your products.

### 3. Changing Supply Chain increases the importance of supplier reliability:

While the supply chain undergoes changes and the concerns of European manufacturers towards the increasing risk of international cooperation grow, supplier reliability becomes the key priority for a successful cooperation. Cultural and geographical proximity and on-time delivery may shorten the acquaintance phase and turn a new and unknown supplier into a trusted partner more quickly.

Megatrends such as globalisation and consolidation drive substantial changes in the product supply chain. In the long term, supply chains will continue to undergo changes, becoming more innovative, open to customisation, as well as lean, fast, and flexible. With the ongoing improvement of the supply chain, supplier reliability will continue to play a significant role for European OEM’s.

**Tip:**
- Developing country exporters showing cultural and geographical proximity will have better opportunities in relation to entering the European market. Geographical proximity and/or knowledge of the European language can significantly improve the delivery process by offering fast and flexible product supply and services;

With the growing role of international cooperation, European companies will increasingly face various risks (for example, an unreliable, inefficient supply chain) that need to be measured and managed in order to keep the total cost of ownership (TCO, including the indirect as well as the direct costs of a product) at a reasonably (low) level. In the short and medium term, European OEM’s will be increasingly looking for the most reliable suppliers and will try to eliminate risk through supplier contract and cost management;

**Tip:**
- In order to minimise the risk, you could offer less complex products. Work on your supply chain to be able to offer on-time delivery and stress this in your sales pitch;

In the medium and long term, the demand will shift from branded only products to quality products, creating opportunities for smaller suppliers from developing countries. Developing country exporters will benefit by specialising in niche, high quality components that usually have no brand name.
Environmental Trends and Opportunities

1. The “Going Green” trend and political measures are driving the demand for efficient and sustainable electronic solutions:

Environmental and political market drivers will increase the demand for intelligent and efficient solutions, opening doors for innovative suppliers of electronics.

Environmental trends, as well as political measures in Europe, will continue to drive innovations and the demand for efficient, sustainable and green solutions across all application industries, including hybrid and electric vehicles, electronic lighting and renewable energy. Companies who do not invest in the development of efficient electronic solutions may lose their competitive advantage to newcomers.

In the long term, EU policies and increasing cost pressures will drive the launch of intelligent and energy efficient systems such as electric transportation, as well as of efficient production processes such as production automation, thus expanding the demand for electronics.

Tip:
- Strengthen your competitive advantage by investing in new efficient electronics and in intelligent electronic solutions. Develop your know-how by learning from European peers or by means of open innovation. Partner with European OEM’s to co-develop efficient and sustainable solutions;

2. Penetration of renewable sources in energy generation in Europe creates the demand for electronic components in new markets such as Smart Grid, Smart Metering, and energy storage:

The development of renewable energy impacts the rapidly growing demand for energy storage, smart controller solutions and smart meters among other things. Developing country exporters can benefit from these new markets through co-design, as well as by offering own know-how, design, hardware and software to European peers, since Europe currently has few solutions in place.

Development of Smart Grid and energy distribution creates a new market for suppliers of power electronics. The energy distribution market is driven by:

- Technological developments such as management and optimisation of energy supply and demand, as well as the ongoing development of energy smart controllers, storage, transportation and security solutions;
- Technological developments that enable the penetration of renewable sources in power generation (e.g., solar panels, wind turbines);
- Governmental support of the use of renewable energy in the EU;
- Cost-efficiency of power generated by renewable sources.

Tip:
- Opportunities for developing country exporters that have the necessary capacity and know-how include:
  - participation in the Smart Grid pilot projects through co-design. Familiarise yourself with the ongoing and planned Smart Grid projects in all European countries;
  - Specialisation in power electronic components for smart metering. Consider either cooperating with companies that produce Smart Metering solutions, or offering your own solutions, including hardware (complete or assemblies), software, solution design and know-how.

Tip:
- Get more information on EU policies and environmental trends possibly through international support organisations such as the Chamber of Commerce or CBI.
Along with the development of Smart Grid and energy distribution, the importance of smart meters (used not only for consumption recording, but also for two-way communication between the meter and the central system) is set to increase.

The development of energy storage solutions is still an ongoing process. There is a need for energy distribution controllers that permit energy storage, are open, reliable and secure, and that facilitate flexible energy usage. Energy storage is a developing market that boosts the demand for power electronics.

**Tip:**
- Be innovative and open-minded, and approach European peers with your energy storage solutions, offering your own know-how, design, hardware and software. You may consider making your product range more competitive by offering power capacitors and/or all kinds of active and other passive components needed for the control circuitry of the energy storage components. Consider partnership with OEMs in Europe or in developing countries for the co-development of energy storage solutions.

**Political Market Trends and Opportunities**

**1. Political measures accelerate the development of new and existing markets:**

Political measures accelerate the development of renewable energy, electronic vehicles, efficient energy solutions, intelligent electronic solutions and electronic lighting, driving the demand for electronic solutions in the automotive, energy, lighting and other application industries.

A number of EU Directives has been issued in the last few years that accelerate the development of renewable energy sources, electronic vehicles and electronic lighting and drive the demand for electronic components in Europe. As a result, the share of electronics in vehicles is constantly growing and the lighting market has become 100% electronic.

**Tip:**
- Familiarise yourself with the latest and pending European legislation (http://europa.eu/eu-law/index_en.htm or http://www.euractiv.com/) in order to understand the growth potential of new and existing markets. You may consider partnering with other manufacturers from developing countries in order to strengthen your product portfolio or to co-design electronic solutions for new markets such as Smart Grid, Energy Storage, Intelligent controlling units, etc.

Political measures are expected to continue driving the share of electronics in automotive in the short term. Following the example of the US, Europe may impose new directives to ensure personal safety, e.g., mandatory use of rear view cameras and an emergency call in vehicles. Developing country exporters may benefit through a more diverse range of electronic components and/or assemblies/subassemblies for car makers.

**Tip:**
- Diversify your product range to meet the growing demand for electronics in the automotive industry, depending on your resources. Make sure you have ISO 16949 certification that is essential for production, installation and servicing of automotive-related products. If you are unable to approach car makers directly, create alliances with local or European manufacturers specialising in automotive electronic design, for example.

The use of smart metering is already being driven by the state support in some countries such as Italy, Spain, where Telegestore smart meters are used, co-developed by Enel and Endesa. In the long term, the mandatory use of smart metering may be introduced in Europe, thus creating another market for producers of electronic components, assemblies, subassemblies, and dedicated software.

**Tip:**
- Consider sharing your knowledge in the energy industry and in particular in Smart Grids and/or Smart Metering through co-projects with European companies.
This survey was compiled for CBI by CBI market researcher Klaus Dellmann in collaboration with CBI sector expert Günther P. Fandrich

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