

# SUMMARY REPORT

## German Industry Roundtables 2017 in India on Quality Infrastructure – Technical and Regulatory Barriers to Trade



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Report prepared by

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## Executive Summary

Three participatory German Industry Roundtables brought together representatives from industry, testing and certification institutes, Indian regulators, and subordinate institutions to discuss technical barriers to trade and the regulatory challenges of doing business in India. The participants developed possible solutions to the identified challenges the German industry is facing.

Through working groups, in-depth discussions, the exchange of first-hand information on government policies, and targeted online feedback, the three key areas of what comprises Quality Infrastructure were discussed: (1) **standardization**, (2) **conformity assessment and accreditation and**, (3) **product safety and market surveillance**. The key results of the roundtables, summarised below, will direct the work of the Indo-German Working Group on Quality Infrastructure:

### ROUNDTABLES

**29 August 2017**

**Delhi**

General Technical and Regulatory Challenges to Trade

**31 October 2017**

**Pune**

Specific Challenges for the Automotive Industry and Machinery Safety

**2 November 2017**

**Bengaluru**

Standards and Data Protection for Industry 4.0

### Standardisation

- The harmonisation of Indian standards with international standards will reduce transaction costs for companies entering the Indian market.
- The development of a coherent Indian framework linking different enabling technologies, like cloud computing and machine-to-machine communication, for Industry 4.0 and Internet of Things (IoT), is essential.
- Industry participation in standardisation at the national level and India's participation at the international level should be encouraged.
- Standardisation can be used as a means for raising companies' awareness regarding aspects of machinery safety.

### Conformity Assessment and Accreditation

- The non-acceptance of international test reports represents a major concern for German companies as repeated testing – both in Germany and India – causes delays and increases compliance costs.
- There is a lack of conformity assessment schemes for critical IoT parts, such as data centres and IoT devices.
- A lengthy homologation process (of certifying that a vehicle matches specified criteria defined by the government) for automotive industry increases the time to market.
- The General Data Protection Regulation of the European Union (EU) could be used as a reference framework for the proposed Indian data protection regulation.

## Product Safety and Market Surveillance

- Review of the Indian Factories Act, 1948, which does not adequately reflect technological advancements from a machinery safety perspective. Address the existing gaps between central and state level implementation of the Indian Factories Act, which result in differing state provisions.
- Strengthen market surveillance in India by establishing a centrally coordinated market surveillance agency to guarantee effective oversight in India's federal political system. The Central Body of the German Federal States for Safety (ZLS) could provide valuable insights for India.

The next steps include taking up the identified issues within the mandate of the Indo-German Working Group with the concerned ministries and institutions and developing feasible solutions in the best interest of all involved parties. To support this, detailed studies on both the import requirements of automotive and components, and on standards and regulatory framework for machinery safety are being conducted. A concept for a white paper on standardisation aspects of Industry 4.0 and IT security will be developed. A CEO roundtable for German industry in cooperation with Invest India, the Investment Promotion and Facilitation Agency of the Government of India, is being planned for 2018 to facilitate the involvement of concerned Indian ministries and regulatory bodies and institutions.

### **Project Background**

*This series of roundtables was organised as part of the cooperation between the German Federal Ministry for Economic Affairs and Energy, and the Indian Ministry for Consumer Affairs, Food & Public Distribution. Both ministries have established the Indo-German Working Group on Quality Infrastructure. The Working Group's goal is to reduce technical barriers to trade and strengthen product safety through policy dialogue between relevant ministries and regulators – including key stakeholders, such as industry associations, companies, and technical and scientific institutions. As part of the Global Project Quality Infrastructure (GPQI), GIZ – the German Agency for International Cooperation – has been commissioned by the Federal Ministry for Economic Affairs and Energy to support the implementation of the Working Group in India and ensure that concerns of the industry are taken up within the political dialogue.*

*The three roundtables addressed general technical and regulatory challenges, challenges specific to the automotive industry and machinery safety, and standards and data protection for Industry 4.0, respectively. The roundtables were organized by GIZ, in collaboration with the German Embassy and German Consulates, and the Indo-German Chamber of Commerce (IGCC). The Mechanical Engineering Industry Association (VDMA) and the German Automotive Industry Association (VDA) supported the relevant roundtables. Representatives from the Bureau of Indian Standards (BIS), Invest India and sectoral agencies actively participated in the roundtables.*

## First Industry Roundtable on “Quality Infrastructure”

### Introduction

The first German Industry Roundtable on “Quality Infrastructure” took place on 29 August 2017 at the German Embassy, New Delhi. The roundtable was organized by GIZ, the German Agency for International Cooperation, in collaboration with the German Embassy and IGCC. More than 40 representatives of testing institutes and German companies from various sectors –



such as energy, machinery, IT, medical devices and automotive – discussed technical and regulatory challenges they are facing as well as possible solutions. Furthermore, participants had the opportunity to exchange first-hand information on recent government policies and important regulatory changes. Representatives from BIS and Invest India – the Investment Promotion and Facilitation Agency of the Government of India – joined for the second part of the roundtable. They presented their current work and services to improve the business environment in India and responded directly to the German companies’ questions and concerns.

### Key Results

The companies saw that simply getting the chance to collectively share their concerns as an important step forward in India. They acknowledged an increased openness of Indian regulators towards involving the industry in developing policies, for example through public consultations. Participants who were already actively involved in the Indo-German Working Group on Quality Infrastructure appreciated the possibility to comment on draft regulations through the bilateral working group. The participants expressed their aspiration to get even more involved and be able to bring in their expertise.

*“The closer the economic relations between countries become, the more important it is to discuss technical and regulatory questions, such as common standards, testing and certification procedures.”*

*Dr. Jasper Wieck, Deputy Chief of Mission of the German Embassy in New Delhi*

The Indian government shall therefore see them as partners in creating a quality eco-system and better consumer protection. On a similar note, BIS invited German companies to contribute actively in the Indian standardization process by sharing their expertise with BIS’ technical committees.

Participating companies regard the Indian market as attractive and see a lot of potential for German firms. Tapping the attractive Indian market, however, requires overcoming various technical and regulatory challenges.

The results of a live poll taken during the roundtable showed that the majority of participants saw complex and burdensome compliance procedures for regulations as one of the major challenges they face in India. They highlighted that improving testing and certification procedures, such as the recognition of international test results and adopting more international standards, would significantly reduce their costs, time, and business uncertainties. Participants recommended that the Indian government should conduct impact assessments of planned and recently passed legislations in which the implications for companies and consumers are thoroughly evaluated.

*Recognition of international test results and adopting more international standards would enhance the business environment.*

Laws and regulations would need to be enforced more stringently to ensure that no dangerous goods are placed on the market, the German industry as well as testing and certification institutes emphasized. German experts could support India in building an effective market surveillance system, which guarantees product compliance particularly in India's large informal economy.

Participants described the German as well as the European Union (EU) system of quality infrastructure as very mature and developed. Through its active role, Germany as part of the EU has decisively contributed to the development of the international QI system. This puts German experts in a good position to support Indian partners in strengthening the Indian system.



An online feedback survey showed that the participants were highly satisfied with the roundtable: more than 40% of participants stated that the roundtable was 'excellent' while the other 60% said it was 'good'. The participants especially valued the presentation on current and upcoming technical regulatory policies in India and the interactive formats of bringing in their perspectives and experiences (work sessions and fishbowl discussion). The majority of participants appreciated the presentations of BIS and Invest India. They highlighted that receiving information on existing and new Indian regulations was very important and one of the key aspects of the roundtable.

## Identified Technical Challenges

### *Standards and Technical Regulations*

Participants stressed the need for harmonization of Indian with international standards. As standards in the EU are mostly aligned to ISO/IEC standards, this would reduce transaction costs for companies entering the Indian market. Adopting international standards would also be beneficial for the Indian side as this reduces time and cost while allowing India to gain from international experiences.

In addition, clarifications are also required with respect to implementation of certain Indian Standards especially those covered in the technical regulations.

- **Coated steel used in automotive sector:** Certain steel grades used in the automotive sector are not covered by the Indian Standards and as some of the steel grades are regulated in India, the automotive companies face issues during imports. They suggest a review of Indian Standards as well as clarification to custom authorities regarding the exclusion of such steel.
- **Electrical safety in medically used rooms:** Provision has been made in the Indian Electrical Code regarding electrical installations in hospitals; however, it is not aligned to the relevant IEC standard IEC 60364-7-710. For ensuring safety of the patients, it is recommended to review the Indian Electrical Code and align to the IEC standard.
- **LED testing as a part of medical equipment:** Most of the LED when used in the medical devices fail the tests, although it conforms to the standards when tested separately. Therefore, there is a need to review the standard for LED testing which is used as part of medical equipment to align with the international standard IEC 60601-1-2.
- **Breathing apparatus (Personal Protective Equipment):** The Indian Standards needs to be harmonized with the relevant ISO standard.

In general, the participation of industry at the national level standardization as well as India's participation at the international level should be encouraged.

Participants suggested that the industry should be given more time – at least a year – to prepare for the implementation of a new or revised standard. To further ease the transition, the older version of the standard should be allowed concurrently for that duration.



### ***Conformity Assessment and Accreditation***

Lack of acceptance of test results from accredited foreign labs was one major concern for the German companies. The burden of testing both in Germany and India led to significant delays and increased costs of compliance. This problem is worsened due to inadequate capacities and capabilities of Indian labs causing further delays and complications.

Also, diverging interpretations of regulations by the regulators and custom authorities result in business uncertainty. Similarly, German companies pointed to the fact that for many emerging technologies such as robotics and artificial intelligence conformity assessment procedures are not yet available.

Participating companies shared cases in which cumbersome conformity assessment procedures – such as destructive tests and long delays – impeded their sales in India. This is particularly a problem for costly products of which a company only produces small numbers. Participants recommended a reduction of the number of samples for high value products.

*Challenges regarding conformity assessment sometimes make business unviable as a whole.*

The roundtable revealed a lack of clarity on the new medical devices rules in India that will come into effect starting from January 2018. The new rules are very important for the German industry where many companies operate in the medical device sector.

The Government of India is bringing more products under the Compulsory Registration Scheme covering 44 products. Many electronic products under this scheme will have an impact on the German industry and therefore need to be closely followed (<http://crsbis.in/BIS/products.do>).

### ***Product Safety and Market Surveillance***

Participants described market surveillance as the most overlooked issue in India. Given India’s large informal sector, the focus of market surveillance should be on the unregistered manufacturers rather than the registered ones, which were already complying with regulations.



The industry experts spoke in favour of establishing a centrally coordinated market surveillance agency to guarantee effective oversight in India’s federal political system. India could learn from the German market surveillance system that is based on a similar federal structure as in India. The experience of the Central Body of the German Federal States for Safety (ZLS) could therefore provide valuable insights for India. As part of an effective market surveillance system there

is a need to raise awareness of consumers that will ultimately lead to better quality and safe products on the market.

The German companies also suggested that the frequency of the samples to be submitted for market surveillance in India should be reviewed. Especially when product samples are not readily available with the companies or products are costly and produced only in small numbers, the time provided to submit samples and its overall frequency could be relaxed.

*A centrally-coordinated Indian market surveillance system could improve the quality and safety of products on the market.*



## Next Steps

- Follow-up the identified issues with the respective companies to analyse them in more depth and jointly discuss feasible solutions.
- Take up issues within the existing mandate of the Indo-German Working Group on Quality Infrastructure with the concerned institutions.
- Some of the issues may require a political agreement. The project will work out proposals for discussion within the political dialogue of the next annual meeting of the Indo-German Working Group, beginning of 2018.
- The project will organize workshops where there is a need for more information on best practices such as for market surveillance systems.
- Two further sector specific roundtables will be organised on the automotive industry and machinery safety in Pune on 31 October 2017 and on digital technologies and mechatronics in Bengaluru on 2 November 2017. Here, GIZ plans to invite technical members of BIS who can reply to specific queries of industry representatives. In preparation to the next roundtables, GIZ intends to conduct an online survey to tailor the agenda even more to the participants' needs.

### Feedback Results

An online survey among participants during and after the event showed that most companies see standards and technical regulations as the area with the most relevant technical and regulatory barriers to their companies (75%). This is followed by conformity assessment and accreditation issues (50%), regulations favouring Indian companies, for example local content requirements (44%), and market surveillance (38%).

# Second Industry Roundtable on “Technical and Regulatory Framework for Machinery and Automotive Sectors in India – Identifying Challenges and Developing Proposals”

## Introduction

The second German Industry Roundtable on “Technical and Regulatory Framework for Machinery and Automotive Sectors in India – Identifying Challenges and Developing Proposals” was organized on 31 October 2017 in Pune, India. The interactive roundtable provided an opportunity for the German industry in automotive and machinery sectors to share their experiences in India and propose solutions. Furthermore, the participants had the opportunity to exchange first-hand information on recent government policies and important regulatory updates.



Representatives from BIS, Invest and the Automotive Research Association of India (ARAI) actively participated in the roundtable. They presented their responsibilities and current regulatory topics, and responded directly to questions and concerns of Germany companies.

The roundtable was organised by GIZ, in collaboration with the German Consulate General in Mumbai and the Indo-German Chamber of Commerce (IGCC). This event was also supported by the German Automotive Industry Association (VDA) and the Mechanical Engineering Industry Association (VDMA). About 50 representatives from German companies and testing institutes from the automotive and machinery sectors discussed the technical and regulatory challenges they face as well as possible solutions.

## Key Results

For the **machinery** sector – and specifically pertaining to machinery safety – participants mentioned the need to review the *Indian Factories Act, 1948* ([→ link to Act](#)), and the importance of increasing the level of awareness for machinery safety standards in companies. The deviation of regulations at the national and the state level in India was a concern raised by German machinery companies. BIS provided insight on their standardization initiatives and its own role in effective implementation of regulations.

In the **automotive** sector participants highlighted the importance of a clear and consistent policy roadmap, especially relating to new technologies, such as cyber security, or standards for electrical vehicle charging infrastructure and car-to-car communication. Frequent policy changes in the automotive sector would create business uncertainties and impact the investment climate. To help the industry manage compliance better, participants suggested clearer and timelier information about the standards proposed to be brought under technical regulation (e.g. automotive glass). Participants also shared their views and experiences on the homologation process, and corresponding delays that the lack of recognition of test results in India create.

*Frequent policy changes in the automotive sector would create business uncertainties and impact the investment climate*

Invest India showcased how they assist the industry in dealing with issues that make doing business in India more challenging. ARAI presented the latest developments from the technical regulation point of view, which was of interest to automotive and component manufacturers.

## Specific topics discussed

### *Machinery Safety*

Machinery safety, in the traditional Indian context, is covered from an occupational safety standpoint. More recently, there has been a shift to seeing machinery safety as an integral part of product safety. Participants pointed to the need to raise the awareness of Indian companies about machinery safety standards. These discussions can be categorized into four areas: 1) central and state level regulations, 2) standardization in machinery safety, 3) compliance, and 4) awareness and capacity building. Other areas like use of technology, incentivising mature practices, and the role of top management were also discussed:



- 1) Based on the *Indian Factories Act, 1948*, each state formulates its own rules, which results in differing provisions between states. As industry is interstate, compliance is difficult and expensive. From the machinery safety perspective, participants identified the need for review of the Factories Act: the regulation does not adequately reflect the technological advancements made in manufacturing processes. Moreover, the present regulation does not sufficiently reflect sectoral requirements such as in the field of pressurized equipment. Suggestions were made for the government to develop a *National Safety Code* that could provide detailed guidelines for coordinated rules across different states, and could also include

*Each state formulates its own rules, which results in differing provisions between states*

sector specific safety guidelines. Participants would welcome a comparative analysis of the Indian regulations and the European machinery directives to highlight facets of machinery safety not yet covered in India.

- 2) Participants see standardization as playing an important role in raising the awareness of companies about relevant machinery safety aspects. Also, it could strengthen the regulatory framework in India by implementing international best practices, which are reflected by international standards. BIS has created a new sectional committee (*Manufacturing Machinery and their Safety Sectional Committee*, MED40) for framing Indian standards to ISO standards. This technical committee is the mirror committee of ISO/TC199. By next year, India is likely to adopt 33 ISO standards relating to machinery safety. BIS proposed bilateral cooperation with DIN, which holds the secretariat of ISO/TC199 ([→ link to ISO website](#)) such as through a twinning arrangement.
- 3) Certification schemes and their role for ensuring machinery safety in India were highlighted. One idea was to introduce a safety mark similar to CE marking or star labelling. Currently, there are no tests and documentary requirements (audits) for machines – be it the existing or new. Solutions such as having safety auditors in line with energy auditors were proposed and suggestions for a safety mark guideline document may be taken up with the concerned regulators.
- 4) Participants also discussed ways of increasing the capacity within the Indian workforce for the implementation of machinery safety procedures. One way would be to develop training modules, which should also be introduced in the syllabus of engineering colleges and their accreditation criteria. Additionally, workforce capacity building would also be an area in which relevant industry associations could play a more active role in India.

Industry participants suggested that new technologies in the context of the Internet of Things (IoT)



could play a role in enhancing machinery safety – perhaps using new ways of tracking processes and machine performance – while incentives and recognition for those installing and maintaining safe machines would involve the industry more. Another suggestion was to make incentives through insurance providers such as Employees' State Insurance Corporation. Roles and responsibilities of top management also need to be well

defined in the context of machinery safety by being part of organizational strategy and increasing their liability through existing legislations.

## *Automotive*

Some participants raised their concerns about the length of the homologation process in India, which is longer than in Europe and therefore increases cost and their time to reach the market. Recognition of test reports from other countries would be one way of reducing time and costs in the homologation process. It was also discussed whether India should consider becoming a member of the World Forum for Harmonization of Vehicle Regulations (WP.29) ([→ link to UNECE website](#)) of the United Nations Economic Commission for Europe (UNECE) as this would reduce the extent of homologation as a trade barrier. Participants proposed for a revision of Rule 126 of the *Central Motor Vehicles Rules, 1989* (CMVR) ([→ link to Rules](#)) and authorise testing by private laboratories to reduce time.

The dialogue also focused on aftermarket parts that are available without any certification. These same parts have to undergo mandatory testing as part of the vehicle, but when they are sold standalone in the aftermarket there is no need for testing or certification, which is a gap in policy implementation. Here a cooperation opportunity was identified for bringing in German experts to elaborate on the regulation of aftermarket parts.

In light of the Indian government's push towards electric vehicles (EVs) the German companies advocated for harmonisation of standards rather than the development of India-specific standards. They raised their concerns about current government procurement activities that send ambiguous messages about the standard, which will be used in the Indian market for the long-term.

The desire for policy certainty was emphasised by the German companies in other areas also. A clear and stable Indian roadmap for new technologies would improve the business climate. The participants referred to the ban of diesel vehicles in the Nation Capital Region as a negative example. Updates in policy should be a well-planned and a collaborated exercise. The German companies expressed their interest in using events like this roundtable to discuss reform paths and identify factors that are influential for their business decisions with Indian Government representatives.

*A clear and stable Indian roadmap for new technologies would improve the business climate*

Participants discussed cyber security issues related to new technologies such as connected cars. With increased connectedness of cars, ensuring cyber security requires adequate standardisation and regulation. ISO and SAE International (a US-based standards development organisation), for example, are cooperating in a joint working group with the aim to produce a standard for cyber security by 2020 called *ISO 21434 'Road Vehicles – Cyber security Engineering'* ([→ link to ISO website](#)). Participants underlined the need for harmonization of standards, looking at global best practices and other security assurance programs. It was emphasised that security challenges were constantly changing so continuous risk management efforts were needed.

## Next steps

- Conducting a baseline study on standards and regulatory framework for machinery safety in India and providing a comparison with German/European practices.
- Take-up issues within the existing mandate of the Indo-German Working Group on Quality Infrastructure with the concerned institutions.
- Some of the issues may require a political agreement. The project will work out proposals for discussion within the political dialogue of the next annual meeting of the Indo-German Working Group, beginning 2018.
- The project will organize similar workshops where there is a need for more information on best practices.

## Feedback Results

An online feedback survey showed that the participants were highly satisfied with the roundtable: 40% of participants stated that the roundtable was 'excellent' while 50% said it was 'good' and 10% saw it as 'fair'. The participants especially valued the interactive parallel work sessions and the roundtable discussion. The majority of participants found it very important to learn from other companies' experiences and to receive information on existing and new Indian regulations.

# Third Industry Roundtable on “Standards and Data Protection for Industry 4.0 in India: A German Industry’s Perspective”

## Introduction

The third German Industry Roundtable on “Standards and Data Protection for Industry 4.0 in India: A German Industry’s Perspective” was organised on 2 November 2017 in Bengaluru, India. The interactive roundtable provided an opportunity for the German industry to share their experiences in India and propose solutions. Furthermore, the participants had the opportunity to exchange first-hand information on recent government policies and important regulatory changes.



Representatives from BIS, Invest India and the Telecommunications Standards Development Society, India (TSDSI) also participated in the roundtable. They presented their work and services to improve the business environment in India and responded directly to the German companies’ questions and concerns.

The roundtable was organised by GIZ, in collaboration with the German Consulate General in Bengaluru and the Indo-German Chamber of Commerce (IGCC). The German Engineering Federation (VDMA) supported this event. More than 30 representatives from German companies discussed the technical and regulatory environment in India for a digitised and automated economy, or Industry 4.0. The energy, machinery, IT, and medical device sectors – as well as testing and certification institutes were represented at the event.

## Key Results

The participants discussed conceptual aspects of the Industry 4.0 framework, the role of data protection, and cyber security as well as standardisation needs in this area.

**Standardisation** is seen as a key aspect to be considered for Industry 4.0 and participants agreed that the involvement of stakeholders from industry and academia was essential in this regard. The discussion primarily focussed on the involvement of German companies in Indian standardisation and the ways active involvement of India in international standardisation forums could be enhanced.

Regarding **Industry 4.0** and the **Internet of Things (IoT)** participants emphasised the need to develop a coherent Indian framework which links different enabling technologies such as cloud computing and machine-to-machine communication. The German Industry (*Industrie*) 4.0 framework could serve as a reference, especially in terms of how stakeholders from all relevant fields are involved in its development.

The participants stressed the importance of distinguishing **data privacy** (handling, use and collection of personal data) from **cyber security** (unauthorised access to data). Both play an important role in industry 4.0 and should get due attention. The lack of standards and conformity assessment schemes for critical IoT parts,



such as data centres and IoT devices was discussed as a key problem. Regarding the drafting of an Indian data protection regulation, participants expressed their support for Indian regulations to be aligned with the General Data Protection Regulation (GDPR) of the European Union (EU). Due to a third country clause, the GDPR, which enters into force in May 2018, will affect Indian businesses dealing with data of EU citizens as well.

## Specific topics discussed

### *Standardisation*

Interconnectedness of devices is the key for IoT and Industry 4.0, and participants agreed that standards are more crucial than ever to ensure the interoperability of devices. Participants pointed out that unlike other sectors, IT standards were not developed *after* a technology has matured but *prior* to that. This means that the development of standards must be at the forefront of technological advancement. Not just industry experts but the broad involvement of stakeholders was needed, including academics, who were reported to have only played a minor role in Indian standards formulation so far.

The involvement of stakeholders in standardisation was discussed around two themes: 1) India's participation in international standardisation and 2) participation of German experts in Indian standards development organisations (SDOs):

- 1) While pointing to the BIS and TSDSI's primary mandates to provide *national* Indian standards, the representatives of the two institutions stressed the aspiration to participate more actively in international standardisation fora. Opinions differed about the extent to which financial constraints limited India's degree of participation internationally. Participation at the international



level would require repeated involvement of individuals with a high level of expertise over a long period of time – imposing high logistical costs. One idea was to set up a designated Indian fund to financially support those efforts (with joint contributions from the public and private sectors). At the same time, it was discussed that standardisation expertise needs to be built up in India to have greater capacities for international participation. This could be done by investing in a pool of standardisation experts who would represent India on the international level. Some participants explained that in order for India to lead in standardisation it was required to achieve higher investment in research and innovation in general as these are interlinked with standardisation.



- 2) Representatives from BIS and TSDSI invited German companies to get more actively involved in Indian SDOs. Here it was important to show a long-term commitment as personnel fluctuation is not beneficial to sound standards development. The representative from BIS said that all BIS documents were put in the public domain but the amount of comments they usually receive was not that high. The need to avoid overlaps between technical committees of different Indian SDOs (between BIS and TSDSI for example) was discussed. A single representative SDO would reduce the required efforts from companies to get involved in Indian standardisation.

*BIS and TSDSI appealed to German companies to engage more in Indian technical committees.*

Participants see the need for greater consideration of standardisation aspects in Indian policy-making across ministries as this is an area often not considered sufficiently in Indian reform programmes

*Participants said that standardisation shall play a larger role in Indian policy-making.*

such as “Make in India”. It was discussed whether mandatory participation of SDOs in government policy formulations could be one way of strengthening the role of standardisation. A periodic impact assessment

of SDOs would enhance their effectiveness and performance.

Participants stressed that it was necessary to make Indian companies more aware of the benefits of standards compliance. Additionally, the involvement of people and organisations in SDOs shall be recognised more, one possibility is through awards for standardisation experts.

### ***Industry 4.0 and the Internet of Things (IoT)***

Industry 4.0 was described by the German Engineering Federation (VDMA) as the digitisation and greater integration of the components of the value chain, an increased interconnectedness of a com-

pany as well as production units which act autonomously. In Industry 4.0 intelligent products actively support the production process and allow for the creation of new digital business models. Industry 4.0 provides the framework – or vision, while the path to it was an evolutionary process, unfolding at different speeds.

There are competing international frameworks and Industry 4.0 is a concept developed by Germany that differs from the concepts of other countries, such as China’s “Fusion of Informatisation and Industrialisation”, Korea’s “Manufacturing Innovation 3.0”, Japan’s “Intelligent Manufacturing Systems Program” or the United States’ “Industrial Internet Consortium”.



Germany was described as a country that could act as a reference model for interaction between companies, academia and politics for industrial development. In regard to Industry 4.0, the German “*Plattform Industrie 4.0*” brings together companies, trade unions, associations, science and politics to develop a consistent and reliable framework for Industry 4.0 – an approach which could be followed in India as well. The representative from TSDSI appealed to German companies to get involved in the same way in India as they are in the German political-industrial eco-system.

For India, competing frameworks for smart manufacturing need to be analysed and a harmonised framework suitable to the Indian context needs to be developed. A task force of government representatives, industry experts and researchers could be set up and

*The German Industrie 4.0 framework needs to be adapted to the Indian context.*

work to adapt the German *Industrie 4.0* framework to the Indian context. Subgroups of the task force shall be formed to consider the different aspects of Industry 4.0 and enabling policies, regarding cloud computing, data protection, machine-to-machine communication, and cyber security. The Indian small and medium sized companies (SMEs) would require special attention as they play a crucial role for the journey towards Industry 4.0. Participants pointed out that Indian SMEs were not aware of available technologies and access to affordable technologies was a big challenge.

VDMA presented the open interface standard “OPC UA” which defines the mechanisms of cooperation in the industrial environment and acts as standardised information model for the exchange of data and services. Uniform interfaces were an important prerequisite on the way to Industry 4.0 and VDMA has published a guideline, which supports German mechanical and plant engineering companies with the introduction of OPC UA and provides practical recommendations ([→ link](#)).

Regarding the “Make in India” initiative participants raised their concerns about the recent orders which give preferential market access to local manufacturers, particularly the “Public Procurement

(Preference to Make in India) Order 2017” that the Ministry of Commerce and Industry (MoCI) issued on 15 June 2017 ([→ link to MoCI website](#)), and the “Public Procurement (Preference to Make in India) Order 2017 – Notifying Cyber Security Products in furtherance of the Order” that the Ministry of Electronics and Information Technology (MeitY) issued in September 2017 ([→ link to MeitY website](#)).

### ***Data Protection and Cyber Security***

Data privacy (handling, use and collection of personal data) needs to be distinguished from cyber security (unauthorised access to data) and both are of crucial importance for Industry 4.0 and the IoT.

A landmark decision on 24 August from the Indian Supreme Court declared privacy as a fundamental right and India is in the process of formulating its own data privacy and protection regulations. From the perspective of roundtable participants, it would be beneficial if this was aligned with the GDPR. Through interconnected value chains and sharing of data (also intra-firm) the GDPR would be applicable to many Indian companies. However, participants said that there was low awareness in both Indian companies and from policy-makers about the GDPR. They suggested organising a GDPR workshop to augment industry awareness in India and inform policy-makers under the framework of the Indo-German Working Group on Quality Infrastructure.

*Participants favour an alignment of data protection regulations in India and Europe.*

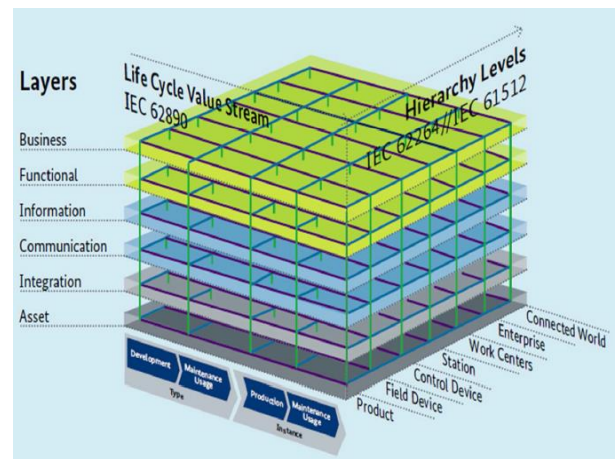
With regard to cyber security, participants stressed that certification was crucial; especially to ensure that data centres and IoT devices complied with stringent standards. Data centres are critical infrastructures needing mandatory certification. In a network of interconnected IoT devices a single in-

*Conformity assessment can play an important role to ensure security of critical components in the Internet of Things: data centres and interconnected devices.*

secure device could potentially undermine the security of other IoT devices. Hence, certification was required to show conformity with applicable security standards as well as functional safety. Global test reports should be accepted to avoid an unnecessary increase in conformity assessment costs.

A representative from the German Association for Electrical, Electronic & Information Technologies (VDE) presented the Reference Architectural Model *Industrie 4.0* (RAMI4.0) which is available as standard DIN SPEC 91345. RAMI4.0 is a three-dimensional layer model which acts as a basic architecture for Industry 4.0 and shall support its implementation at a practical level. Special emphasis has been given to security aspects, which are inbuilt in the different layers of the model as well as along the value stream (security by design).

The participants proposed publishing a White Paper on data protection that could provide inputs from the German point of view for the currently drafted Indian regulation on data. Specific to data protection in Industry 4.0, the White Paper could outline what data needs to be protected, from whom, how to protect data, and what degree of transparency was needed. The White Paper could also inform about the role of standardisation and conformity assessment procedures. A recent paper by the Telecommunications Research Authority India (TRAI) on “Privacy, Security and Ownership of the Data in the Telecom Sector” (released on 9 August 2017, [→ link](#)) was appreciated by participants. The paper raises important questions that should also be taken up by the ten-member task force, which has been set up by the Government of India to develop a draft regulation on data privacy (including representatives from the Department of Telecommunications, MeitY, the Unique Identification Authority of India, and the academic community).



**Reference Architecture Model for Industrie 4.0.**

Source: Plattform Industrie 4.0 and ZVEI

## Next steps

- Conceptualise a White Paper on standardisation and data protection for Industry 4.0 in India.
- Develop a proposal for organising an Indo-German expert’s workshop on the EU General Data Protection Regulation (GDPR) with representatives from the industry and government. The workshop shall raise awareness of the implications of the GDPR for companies in India and discuss possible policy level inputs.
- Further Indo-German exchange on IT security and certification needs in the context of the Internet of Things and Industry 4.0 (e.g. for IoT devices and data centres).
- Participation of industry at the national level standardisation, while and India’s participation at the international level should be encouraged.

## Feedback Results

An online feedback survey conducted by GPQI-India showed that the participants were highly satisfied with the roundtable: 50% of participants stated that the roundtable was ‘excellent’ while the other 50% said it was ‘good’. They especially valued the interactive parallel work sessions and the roundtable discussion. The majority of participants found it very important to learn from the experiences of other companies and to receive information on existing and new Indian regulations.