iPoint – guide

iPoint

From Compliance to Sustainability

Managing Material Life Cycle in the Circular Economy Era

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Introduction

Sustainability is good for business. Sustainable companies prove to be the most successful and resilient ones – not just in volatile times. This is evidenced by academic research and Wall Street reports, but also by companies' financial performance. As a result, more and more companies are going beyond mere obligatory compliance with legal and customer-specific requirements: they're combining their business and sustainability strategies and publishing integrated reports which merge business and sustainability disclosures. Thereby, compliance with the law is a necessary precondition for truly sustainable products and a truly circular economy. Software provider iPoint is here to accompany you on your journey from compliance to sustainability – whether you are right at the beginning or have already embedded sustainability completely into your culture and everyday operations.

This guide is addressed to senior decision makers, managers, compliance officers, engineers, and any corporate citizen interested in the most important steps of your journey from compliance to sustainability. Starting with material compliance, we will explore the entire material life cycle and the connections between corporate sustainability goals, circular economy, and digital technology. Thereby, we will lay the focus on business processes, IT solutions, and the utilization of data as the three key elements which – in combination with sustainability and the circular economy – create greater value for companies and their value chains.

1. We are living in a material world

Materials and substances are the fundamental building blocks required to produce bigger components, then large assemblies, and finally complete physical products such as smart phones, medical devices, pickup trucks, electric SUVs, tractors, and airplanes. This is true whether you're a small mom-and-pop shop or a major Fortune Global 500 corporation.

Material and substance management is a key area for any company that builds physical products.

Let's examine the world of materials. In general, there are three types of materials:

1. production materials – used to make engines in airplanes, vehicles, TV screens, medical equipment, etc. (note that some production materials may not end up in final products; they include, for example, volatile organic compounds that evaporate within a period of time)
2. non-production materials – they are used in the production process, but do not end up in production parts, e.g., conveyor belts used at plants to produce airplane parts, toilet paper used in facilities, ink in pens, packaging boxes to ship physical parts –, and
3. post-production materials – including service materials and chemicals.

Each type of material includes two major categories: dimensional materials – i.e. articles with shape, hard parts, e.g., medical needles, rubber balls, and steels – and non-dimensional materials – i.e. wet chemicals, mixtures, and fluids.

Production, non-production, and post-production materials and substances are often managed in different ways, resulting in multiple processes across multiple departments and business units. In many cases, these processes have evolved separately, at different times, with different objectives in mind, and often using different IT tools and databases. Material and substance management is quite a complex task; considering its direct impact on company operations and the bottom line, it deserves attention.

Complying with various governmental material and substance-related regulations is a must for every company which produces physical products. With the increasing industrialization, many new regulations started to emerge, in particular at the end of the 20th century. For example, the European End of Life Vehicles Directive (ELV), developed in the late 1990s, regulates the end of life treatment of automotive products, including dimensional hard parts such as bumpers as well as non-dimensional materials such as oils and lubricants. Occupational safety and health

regulatory requirements such as the Occupational Safety and Health Act (OSHA) have existed for quite a long time. OSHA regulates non-dimensional chemicals and mixtures that plant workers process and handle, with the purpose to ensure that the health, safety, and environmental impacts are monitored and controlled. However, most finished articles are exempted from OSHA requirements, except for substances that may get released during the manufacturing process.

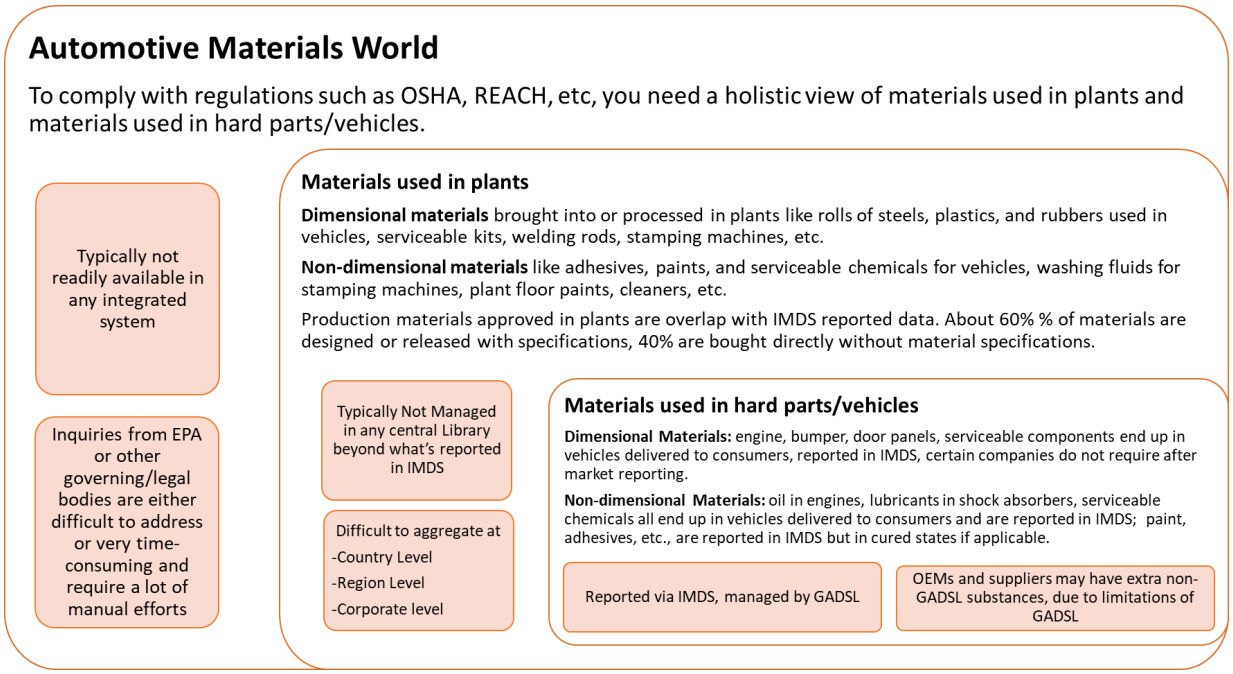
Regulations change and new ones emerge. More and more regulations and directives are enacted to regulate both dimensional and non-dimensional materials and substances covering production, non-production, and post-production uses. The EU regulation REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals), which came into force in 2007, has influenced other countries and jurisdictions to implement similar regulations.

Thereby, transparency and traceability are becoming key requirements. Consumers, investors, NGOs (Non-Governmental Organizations), and government agencies are demanding to know what's inside the products companies produce and place on the market. "No data, no market", the slogan of EU REACH, places responsibility on the industry to manage the risks from chemicals and to provide safety information on the substances. California Prop(osition) 65, officially known as the "Safe Drinking Water and Toxic Enforcement Act", is another example of these "right-to-know" types of laws. Like with EU REACH, consumers have a right to request from companies that they disclose SVHCs (Substances of Very High Concern) in their products. Companies are obligated to provide the data to consumers within a limited timeframe (e.g., 45 days under EU REACH). Under the auspices of the EU Circular Economy Action Plan, driven by recyclers, additional information has been asked to be disclosed, e.g., copper in the metal streams. NGOs, on the other hand, have also been pushing the envelope to include more potentially hazardous and high-risk substances in future restriction lists.

When we add up all these complexities, risks, and challenges, the need for more sophisticated processes and better tools becomes obvious.

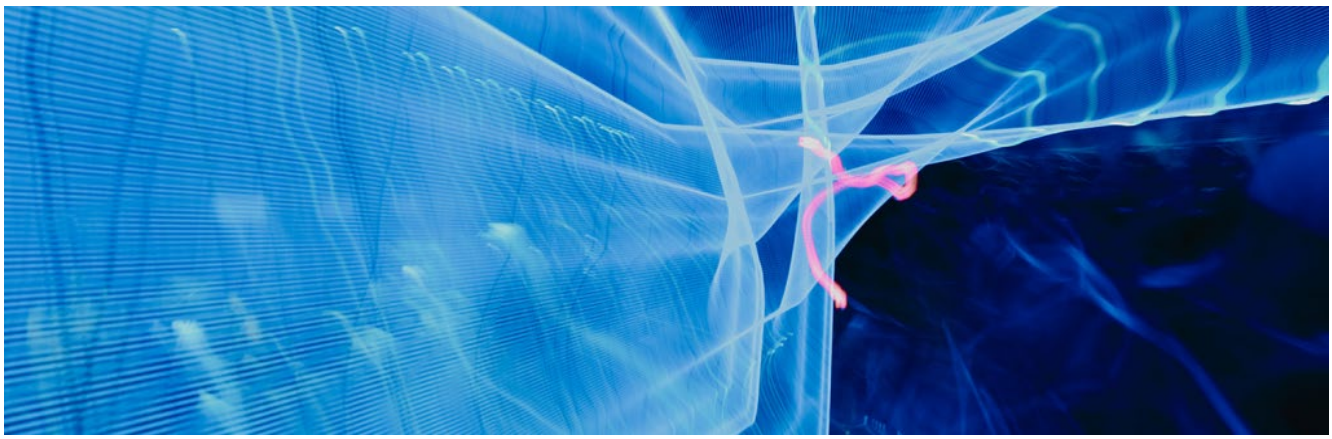
Below is a high-level diagram of how a typical "material world" looks like in the automotive industry. It illustrates how different materials (production, non-production, and post-production) are managed utilizing different processes and tools. Details will be explained in later sections.

Figure 1: Typical material world in the automotive industry



*GADSL is the Global Automotive Declarable Substance List created in 2005 to manage substances of concern in the automotive industry,

*IMDS is the International Material Data System, a central database launched in 2000 for collecting all part, material, and substance data for automotive OEMs (Original Equipment Manufacturers)/suppliers.



2. The current state of material compliance management

Materials and substances used in manufacturing plants need to comply with health, safety, and environmental regulations surveilled by authorities such as the EPA, OSHA, and ECHA , to name but a few. Regulations governing materials and substances in articles and complex products include specific restrictions and reporting requirements regarding certain substances in articles; EU, South Korea, and China ELV regulations are good examples of this. EU REACH, US TSCA (Toxic Substance Control Act), California SCP (Safer Consumer Products), UNEP (United Nations Environment Programme), and POP (Persistent Organic Pollutants) regulations also govern the use of certain substances in articles. This list goes on, with far too many distinctive regulatory requirements to mention individually in this article. In sum, material compliance management is a complex task, and manufacturing companies are permanently challenged to meet the ever-increasing scope of requirements.

In response to this, a small number of companies have developed various IT tools to help organizations manage their materials and substances for different purposes – from data collection and compliance checks to various reporting capabilities such as generating compliance certifications and reports to ensure products can be sold in all relevant markets.

Some IT tools have been developed by specific industry sectors. In the automotive industry, for example, there is IMDS (International Material Data System) – a centralized data reporting tool developed more than 20 years ago to meet the EU ELV requirements. It was the first industry-level tool adopted by many relevant automotive industry players, including OEMs and suppliers around the globe. Over the past two decades, IMDS has incorporated several new regulations such as REACH, SCP, TSCA, and California Prop 65.

In response to more specialized requirements, a small number of companies have developed IT tools to manage compliance for materials and substances used in production and processing. These tools aim to enable the collection of chemical composition data, toxicity, and hazardous properties, performing risk assessments and generating various reports and documents, such as GHS-compliant SDS (Safety Data Sheets), secondary labels, transportation documents, etc. Some tools are focused on managing workplace health and safety, others on managing hazardous chemical inventories.

There is a continuous influx of regulatory requirements to respond to. In some cases, a new type of requirement emerges, going beyond the coverage of traditional material and substance compliance processes. The existing US Conflict Minerals and the upcoming EU Conflict Minerals requirements are clear examples of regulations

which do not prohibit substances (3TG – Tin, Tungsten, Tantalum, and Gold), but require companies to demonstrate due diligence and responsible sourcing by reporting to authorities with the goal of ensuring that the 3TG trade profits are not used to finance armed conflict and atrocious human rights abuses in conflict-affected and high-risk areas (CAHRAs). The requirements of the EU Green Deal and the WFD (Waste Framework Directive), as well as California SCP (Green Chemistry) laws are all new additions which directly or indirectly impact material compliance programs and create more challenges for all companies.

To date, (1) only a handful of IT solution providers are capable of managing the whole material world, (2) few are able to do so in an integrated manner, and (3) even fewer are proactively incorporating new and emerging regulations and initiatives and going beyond compliance to support companies in achieving their corporate responsibility and sustainability goals.

To save on development and maintenance costs, practically all companies prefer to have fewer vendors and IT tools to manage the whole material world and all related requirements. Moreover, utilizing an integrated system makes the tasks of managing the complete material life cycles much easier. For example, one can search and analyze all kinds of data not only for compliance purposes, but also to tackle broader sustainability and corporate responsibility requirements.

Another benefit of having integrated processes and tools is that they remove the need to build complex interfaces between different vendors' tools and databases. This makes analysis and reporting more accurate. It also reduces the risk of errors and, more importantly, of non-compliance. In EU REACH, for example, many restrictions do not distinguish between SVHCs used in plants and those in finished articles. Hence, companies must be able to sort, aggregate, and report the usage of SVHCs in parallel processes – those related to finished parts and those used in the manufacturing process and maintenance. The US EPA has also started collecting data for chemicals contained in both dimensional hard parts and plant used chemicals and mixtures.

Most manufacturing sectors, including electronics, aerospace, and medical devices, share a similar challenge of having to report the same material or substance several times. Using the automotive industry as an example, as shown in Fig 1, the same material or substance needs to be reported, first in plant reporting systems to fulfill environmental, health, and safety regulatory requirements related to production, and then again into IMDS to ensure that products, parts, and components comply with regulations before they are placed on the market (ELV, REACH, etc.). To report SVHC uses for the whole company without an integrated central database and integrated central processes, one has to expend secondary efforts, often including manual data processing, sorting, and matching, to meet the reporting requirements. This can be a lengthy and costly process, and it can increase the risk of reporting errors and ultimately lead to non-compliance.

From an efficiency and effectiveness perspective, both external stakeholders (suppliers and customers) and internal stakeholders (engineers, environmental officers, purchasing managers, plant managers, etc.) would be much happier using a single data entry portal and a single approval review tool instead of multiple tools, and many user interfaces, to do their jobs. For the sake of better managing IT systems, a central and integrated database is often better than several standalone disintegrated databases. In many cases, different vendors may also compete, which makes system and data integration even harder.

When existing requirements change, or new ones emerge, the benefits of an integrated system become even more obvious. One example are conflict minerals, whereby combining substance-level data from IMDS with supplier information, one can quickly identify those parts, components, and materials that contain 3TG, and focus only on relevant suppliers. With all the necessary data in one place, reporting is also

simplified, even when requirements demand a specific reporting format to be followed, such as the CMRT (Conflict Mineral Reporting Template).

Another important benefit of an integrated solution is speed and agility – enabling an organization to react to new requirements very quickly, with little or no additional development.

3. From compliance to sustainability: a natural path to managing material life cycles

Meeting all local and global regulatory requirements is a must for all companies doing business in the 21st century. Consequently, a robust material compliance process with sophisticated tools is necessary to ensure compliance with the ever-changing laws to avoid recalls, fines, costly redesigns, and bad press.

However, developing robust material compliance processes and tools is a complex task which is very difficult to achieve alone. For the automotive industry, it took almost three years for the seven OEMs working with EDS (Electronic Data Systems) to agree on and develop a central database called VDA/EDS system, which was renamed to IMDS and launched in June of 2000. In the first few years after the launch, all OEMs and suppliers were struggling to achieve high-quality data inputs into IMDS. It took four years until IMDS reporting became a mandatory requirement – with PPAP (Production Parts Approval Process) coming into place in 2004. A year later, GADSL was issued, further helping the IMDS ecosystem to standardize. Data quality has been a continuous improvement task until now.

Not only this process took a lot of time, but it was also quite costly:

Judging by the size and reach of the system, the cost of developing IMDS with all the supporting infrastructure, over 20 years, is likely in the billions.

Nonetheless, many companies have come to realize the value of IMDS, and the data collected, as well as individual material compliance processes and tools set up within each company. IMDS effectively helped many organizations better utilize data required to comply with the ELV Directive in the early years, and later to cover even more regulatory requirements such as REACH, US TSCA, California Prop 65/SCP, and WFD (SCIP).

Looking back at the last 15-20 years, one may discover that many sustainability goals and targets companies established on a voluntary basis have now actually become regulatory requirements. Customers, environmentalists, NGOs, and governments often encourage companies to set sustainability goals and develop technologies and infrastructures to use

more recyclable, renewable, reusable, and lightweight materials. EU governments are actively looking to boost the use of recyclable and reusable materials, particularly for critical materials. The End of Life Vehicles Directive and the related RRR (Reusability, Recyclability, Recoverability) Directive come with certification requirements, which started in the EU and now extend to other countries and regions. To go one step further, in order to remove barriers to recycling, the EU is making SVHC reporting mandatory from January 2021 as part of the EU WFD requirements in its SCIP (Substances of concern in articles as such or in complex products) database. The recent EU Green Deal initiatives are yet another example of regulations designed to shape a more sustainable future, in this case by ensuring the EU's climate neutrality by 2050. In July 2020, the EU announced to add "plastic packaging waste taxes and CO_2 border taxes starting 2021 and 2023 respectively" to drive the circular economy adoption using economic measures. More recent examples include the Dutch Child Labor Due Diligence Act (2019), the Australia Modern Slavery Act (2019), and proposed legislation in Germany and the EU requiring companies to undertake human rights and environmental due diligence. We expect that many sustainability initiatives of today are likely to become regulations of tomorrow.

Thanks to digitalization, new tools, and innovations revolutionizing material life cycle management have entered the scene. For example, the "digital twin", an adaptive virtual model of a physical product, which is supported and accessible throughout the entire digital life cycle, can have a huge impact on almost every aspect of product life cycle management. Digital twins can help organizations establish traceability of materials, components, parts, and products from design, development, and manufacturing, throughout the use and reuse phase, to the material recovery phase. Digital twins have brought a big change to traditional ways of managing material life cycles and have contributed to the emergence of new business models.[1]

Many companies have recognized the necessity of shortening product development cycles and improving engineering efficiency – which is vital for a company's success and survival in such a competitive market. By using digital tools and integrating substance and material data related to their compliance status, environmental impact, as well as alternative selection abilities into product manufacturing processes, companies can reduce or even eliminate a range of costly and time-consuming activities, e.g., physical testing, inspection, verification, and certification, to name but a few.

The general trend also shows that companies are shifting their focus towards a more holistic material life cycle management driven not only by regulatory requirements, but also by corporate sustainability and business efficiency requirements.

3.1 End-to-end material life cycle management is key

When it comes to materials in products, what we call "end of life" is also the "beginning-of-life". However, this does not mean that the recycled materials at the one end of life will have to come back and be used in exact applications. They can be used as other applications due to special requirements of certain applications. This idea isn't new, but only around 20 years ago the mindset started to change and challenge the old-fashioned linear economy cradle-to-grave approach to managing material life cycles. The idea that materials shouldn't be wasted when a product reaches its end of life is captured under the broader term "circular economy", which covers much more than materials. It looks at the entire system of how we design, finance, produce, and consume goods and services, across

1 Cf. Aaron Parrott, Lane Warshaw: Industry 4.0 and the digital twin – Manufacturing meets its match. Deloitte Insights, May 12, 2017: https://www2.deloitte.com/us/en/insights/focus/industry-4-0/digital-twin-technology-smart-factory.html

all sectors of the economy, and how we treat them beyond their useful life. Circular economy focuses on the social, environmental, and economic benefits not only for individual actors, but also for the broader value chain. According to the publication Growth within: A circular economy vision for a competitive Europe by the Ellen MacArthur Foundation and McKinsey Center for Business and Environment, the potential economic benefits of going circular "could boost Europe's resource productivity by 3 percent by 2030, generating cost savings of €600 billion a year and €1.8 trillion more in other economic benefits."

Setting up a complete end-to-end material life cycle management process is a key success factor for any company, but particularly for large multinational organizations. For OEMs, the cost of raw materials is a significant contributor to overall production costs – and can range from approximately 40% in the electronics industry to more than 70% in the automotive sector. Managing materials efficiently and reducing material costs and waste have a tremendous impact on profitability. For a major OEM, a 2-3% reduction in material costs translates to billion-dollar opportunities. This is where an end-to-end material and substance management process plays a key role, as it can provide benefits far beyond material compliance management. Appropriately integrated, it can work in conjunction with core product development, design and engineering, manufacturing, supply chain management, and risk management processes to achieve business objectives, sustainability goals, and an easier transition to the circular economy.

The process should cover all key areas. An effective material and substance data collection and analysis can support an in-depth approval review process. An effective tool would allow multiple stakeholders to work seamlessly together in reviewing new and existing materials and substances. Consider the different aspects of an effective and thorough approval process for a typical manufacturing company: Product designers and engineers will review material specifications, test data, and assess the quality of a material. The Environmental manager wants to review environmental data, corresponding regulations, and also perform risk analysis. Health & Safety officers need to evaluate the impacts and risks of putting materials and substances into the workplace. Companies also have toxicologists, purchasing officers, facility managers, inventory managers, and possibly many more stakeholders who all have different interests in materials and substances.

Despite the clear need for a more harmonized approval process, stakeholders still operate in silos. The material and substance approval process is often duplicated across locations; material specifications and data already collected by one team may not be available to another. Certain departments may not have access to critical information about what certain suppliers actually supply – and in the case of conflict minerals this could be a significant risk. Substance and material data gathered for compliance purposes can assist designers and engineers to make better choices – and design for compliance and sustainability, significantly reducing the risks of product remanufacturing, delays, and recalls.

This stream of separate processes and tools should become integrated and incorporated into the organization's core business processes and supplier management in a way that it is auditable, with roles and responsibilities clearly defined. Without a robust business process, one cannot build efficient IT tools to support the business bottom line effectively.

3.2 Desired state – expanding compliance processes and tools to better manage sustainability

Many companies voluntarily go beyond regulatory requirements, setting higher expectations and standards supporting sustainability initiatives. Many well-known organizations, some of which are household brands, are leading by example and working towards a more sustainable future. With

increasing consumer demand for sustainable and ethical products, demonstrating leadership has become an important characteristic that sets successful companies apart.

Many such companies have chosen to upgrade their existing compliance processes and tools to support their action on sustainability and going beyond compliance, such as

1. Reducing the use of hazardous substances ahead of regulations: Many member companies of the European Automobile Manufacturers Association ACEA and many members of IMDS Steering Committee take a proactive approach to meet and exceed regulatory requirements whenever technically and economically feasible. Examples include the elimination of hexavalent chromium ahead of the EU ELV deadline and proposed to prohibit substances listed in the REACH Annex XIV SVHCs prior to the sunset date, regardless whether authorizations will be issued or not.
2. Increasing the use of sustainable, recyclable, and reusable materials to achieve better circular economy targets: Many automotive OEMs like Daimler, Ford, GM, Toyota, and Volvo have announced their future sustainability goals such as zero crashes, zero emissions and zero congestion, 100% sustainable materials, reduction of CO_2 emissions in new vehicles as well as elimination of CO_2 emissions in all materials used to produce vehicles, and in all manufacturing, and carbon-neutral products and manufacturing. Major high-tech electronic manufacturers have announced their carbon neutrality targets as well. Apple aims to achieve carbon neutrality across their entire business and manufacturing supply chain by 2030 – 20 years earlier than the EU Green Deal target. Microsoft has made the same commitment, whilst Amazon aims to achieve carbon neutrality by 2040, one decade ahead of the Paris Agreement as part of their Climate Pledge.
3. Prioritizing safer materials and chemicals to support design-for-compliance and design-for-sustainability practices before deadlines are set by regulators: We can see this unfold at scale at many levels: at EU-level, State level (California, Washington, Maine, Minnesota) and also at company level. A study by Clean Production Action examines how major retailers like Target, Walmart, and Bed, Bath and Beyond are targeting the reduction of chemicals of high concern to human health or the environment in their products. Many automotive OEMs and suppliers have incorporated the compliance status of materials into design and development phases to avoid late design changes and non-compliance risks.
4. Optimizing manufacturing processes, transport, and logistics to reduce waste and carbon footprint.
5. Implementing material traceability and increasing the scope of reporting beyond regulatory requirements: A range of companies subject to the US and EU Conflict Minerals regulations have surpassed the four legally affected commodities and have added other minerals such as Cobalt and Mica to their reporting and tracking list.
6. Assessing technical and financial feasibility in conjunction with sustainability performance of individual parts, components, materials, and substances: Establishing this baseline allows organizations to create commercially feasible implementation plans to systematically replace current materials with better alternatives.
7. Working closely with suppliers and other value chain actors on aligning sustainability goals to create a bigger impact throughout the product life cycle: Apple, for example, actively work with their suppliers to reduce the carbon footprint and establish a closed-loop supply chain to support their long-term goal of using 100% recycled materials in all of their products. The iPhone 11 Pro is the first

Apple product that contains 100% recycled rare earth metals.

There are many more examples like these practices across all industry sectors.

It is also true that going beyond regulatory requirements can also help companies to reduce financial risk for late changes. For complex products such as vehicles and airplanes, companies need much more time to design and manufacture products. If the governmental requirements do not leave enough time for product redesign and changes, companies would face high costs to make quick change to meet the regulatory deadlines.

4. The role of iPoint

Properly utilized data is a valuable resource. In our increasingly digital world, most efficiency gains, reductions in cost, increases in speed, and quality of decision-making come from the ability to put data to work.

At iPoint, we treat data as the raw material required for good decision-making. It is the starting point for synchronizing, optimizing, and automating business processes.

The era of big data and cloud computing has reduced the costs and complexities of data storage and computing power. In fact, ICT infrastructure has never been more affordable and able to support holistic and integrated software solutions required to:

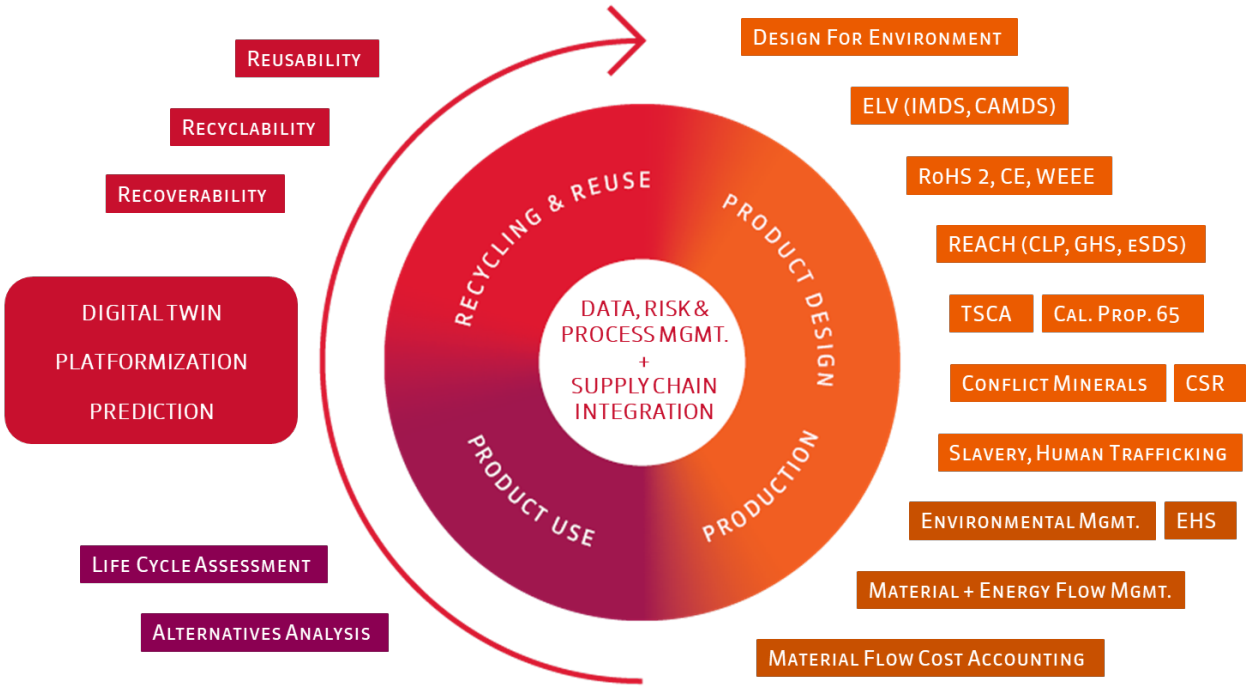
- shorten the product development cycle to achieve faster go-to-market,
- smoothly scale up new production processes and technologies,
- improve supply chain traceability and data transparency,
- measure, track, and improve social and environmental performance,
- leverage data as a strategic asset to gain competitive advantage,
- reduce costs and risks by automating rules, responsibilities, and workflows, and
- eliminate high-risk and non-compliant materials as early as possible.

These strategic objectives point to the need to better integrate and utilize data for business outcomes. iPoint enables companies to achieve this without having to worry about developing new ICT infrastructure and complex software. With iPoint's solutions, companies can collect and analyze all necessary data to assess, report, and make decisions about the environmental,

social, and economic performance of their products, supply chains, and production.

More importantly, iPoint provides integrated solutions to address the entire product life cycle.

Fig 2. iPoint Suite: From Compliance to Sustainability: Digital Circular Economy



4.1 Compliance and sustainability are a part of the same circle

iPoint's focus on the entire product life cycle hasn't changed since our founding in 2001. As a result, our solutions have evolved to support everything from product and material compliance requirements to supporting sustainability and circular economy goals and targets.

We have been proponents of the *digital* circular economy since 2014 – which is reflected in the iPoint circle of solutions.

New and emerging regulations and directives targeting carbon emissions, recyclability, and extended producer responsibility are completely erasing this line between compliance and sustainability. For years, we have been anticipating this, and have worked to build holistic solutions.

4.2 The iPoint Suite

iPoint's software covers a lot of ground. In combination, our software products provide a broad spectrum of compliance, sustainability, and risk management solutions:

- iPoint Compliance (iPCA and Material Compliance)
- iPoint Approval
- iPoint Conflict Minerals Platform
- iPoint Supply Chain Survey
- iPoint Product Sustainability
- iPoint Corporate Sustainability
- iPoint Process Efficiency

Our software is used by tens of thousands of companies across industries to manage complex processes across the entire life cycle and simplify complex tasks, such as:

- Material and substance data collection and reporting
- Hazardous/toxic substance analysis and approval review
- Material specification management
- Supplier management, evaluation, and approvals
- Environmental, health, safety, and transportation compliance evaluation
- Corporate social responsibility
- Critical material management and conflict minerals reporting
- Supply chain risk management
- Establishing baselines, and prioritizing corporate sustainability roadmaps
- Environmental performance
- Feasibility assessments and alternative analysis
- Design for compliance
- Design for sustainability & circularity

As part of our iPoint Suite roadmap, we continue to integrate the most critical components of our software tools to ensure that critical data, analysis, and reporting can be leveraged across different use cases in two main pillars:

- **Compliance:** to account for every substance, supplier, and process that matters to the law, to your company, and to your customers.
- **Sustainability:** to measure, model, and improve the sustainability performance of products, supply chain, and operations.

Expertise embedded in software solutions

We've combined our industry experience with digitalization and subject matter expertise to ensure that we provide future-ready solutions across the following domains:

Compliance	Sustainability
• Substance Regulations • Material Composition • Material Specifications • Design for Compliance • Compliance Reporting • Compliance Approvals • Supplier Assessments • Supplier Quality Management • Supplier Risk Management • Workplace Safety & Health • Quality Management • EHS Approvals • Human Rights Regulations	• Ecodesign • Product Stewardship • Environmental Performance • Circular Product Design • Life Cycle Assessment • Environmental Impact / Footprint • Social Impact • Responsible Sourcing • Process Efficiency • Operational Excellence • Product Carbon Footprint • Corporate Carbon Footprint • Corporate Social Impact

We understand that companies often have a lot to deal with, and sometimes it is not possible for them to tackle every aspect of compliance and sustainability at once.

With iPoint, organizations can start by addressing the most pressing challenges first and scale into other important areas over time. You can start with any combination of the following out of the box solutions:

Compliance	Sustainability
• REACH • SVHC • SCIP • ELV/ RRR • GADSL • California Prop. 65 • ROHS • WEEE • Ecodesign • EU Waste Framework Directive • EU Medical Device Regulation • Conflict minerals regulations • Human rights legislation, including anti-human trafficking-, anti-modern-slavery, and anti-child labor legislations	• Life Cycle Assessments (LCA) • Product Environmental Footprint (PEF) • Environmental Product Declaration (EPD) • Product Carbon Footprint (PCF) • Design for Environment (DfE) • Greenhouse Gas Impact Analysis (GHG) • Circularity Analysis • RRR • Scope 3 (supplier impact) Reporting • Hong Kong Convention (IMO) • Supply Chain LCA Data Management • Supplier Environmental Footprint • Social Sustainability Reporting

4.3 The iPoint CARE principle

Many of our customers say that we've simplified the complex processes of digitalizing the life cycles of products, materials, and supply chain relationships with our CARE principle:

C – collect the relevant data

A – analyze the relations and impact

R – report the relevant information to the permitted stakeholders

E – evolve to minimize risks and identify opportunities

CARE starts with connecting systems and databases in a scalable and cost-effective way. iPoint offers both standard and purpose-built system interfaces, enabling integration between various ERP systems, PLM/PDM systems, CAD systems, as well as industry standard platforms and standards such as IMDS or IPC-1752.

C – Collect

With systems and data sources connected, our software largely automates data collection from various sources, including suppliers and customers. Our supplier data collection and management tools are being used by thousands of companies in different industrial sectors and are ready to handle all product, part, material, and substance data. The collected data is processed and standardized – which turns it into usable information that can be searched, analyzed, and cross-referenced.

A – Analyze

Data analysis, rules, and processing is the backbone of material compliance and sustainability processes. Whether you are looking to phase out certain substances, increase recycled content, or calculate the carbon footprint of your product, iPoint's software solutions largely automate the process. Comprehensive rule groups can replace manual processing and reduce the risk of errors and duplications. For example, the iPoint Restricted Substance List (RSL), kept up to date by our specialists, automates substance compliance analysis, and enables the complete alignment of approval processes for all types of materials and chemicals across business units and

departments. Customers may also choose to include their suppliers and customers in the approval process.

R – Report

Reports drive decisions. Based on official, internal, and custom reporting requirements, iPoint's software not only provides pre-formatted standardized reports to fulfill regulatory reporting requirements, but also ad-hoc reporting capabilities.

iPoint's software helps support standardized reporting and certification requirements from different government agencies that require specific data formats and structures to be followed, including CQC (China Quality Certification) and RoHS Certificates (China), RRR Type Approval certificates (EU), REACH SVHC registration (EU), WFD SCIP (EU), and the SEC conflict minerals filing (US).

Data analysis capabilities feed directly into the reporting. This can help companies save money and time, for example by narrowing their focus to only affected conflict minerals suppliers after analyzing 3TG contained in products.

E – Evolve

Like our customers, iPoint wants to leverage today's technology and opportunities to create a better future. This means that we must stay ahead of the requirements and have solutions ready before the deadlines are approaching. This is exactly what we have done by integrating compliance and sustainability.

With a holistic material life cycle management approach, the software solutions coming together within the iPoint Suite provide many extra functions, data analytics, and detailed assessments to tackle sustainability tasks as listed above, which oftentimes address future regulatory initiatives and improve engineering/manufacturing efficiency, reduce cost and risks, and decrease negative environmental/social impact.

Risk Management

Failure to properly manage compliance and sustainability has significant risk implications for organizations and their value chain.

One prime example is the Conflict Minerals Regulation. It is a regulation, but strategically, it is closely linked to corporate sustainability, responsible sourcing, human rights, and fair trade. Failure to "do your best" in any of these areas come with significant reputational and financial risks.

The same holds true for carbon footprint. Even though carbon emissions aren't globally regulated yet, we can see a heavy focus on decarbonization.

From all directions – consumers, customers, regulators, and investors – we can see an increasing demand for transparency.

We help our customers to safely achieve the transparency needed to facilitate a deeper understanding of the environmental, social, and economic impacts of products throughout their entire life cycle.

5. A look into the future

More than 65% of *consumers* are worried about climate change, and take social and environmental impacts of products into consideration when making purchasing decisions. For manufacturing companies, a lack of social and environmental sustainability can destroy the competitiveness and damage reputation and trust. It's no wonder, then, that in recent years we've seen many leading manufacturing companies announcing their commitment to responsible sourcing, climate action, and transition to a circular economy – as their long-term strategic objectives. We can see entire industries focusing on decarbonization and setting targets in line with the UN Sustainable Development Goals (SDGs).

Governments continue to issue more regulations more often. Countries, states, and cities are releasing long-term sustainability roadmaps and starting to set firm targets and deadlines for carbon neutrality and the Circular Economy. The EU Green Deal is a prime example where investments in sustainability initiatives are paired with regulatory frameworks. Circular economy and critical material strategies are also on the agenda, driving the demand for more transparency and reporting.

Investors are demanding more transparency regarding sustainability performance – a trend that becomes clear when we observe the rise of ESG (Environmental, Social, and corporate Governance) investing. In the past four years alone, the value of those assets that are applying ESG data to drive investment decisions has doubled to $40.5 trillion.

Digitalization and collaboration

A quick glance at our smartphone screen shows us that we live in a digital world and are heavily connected. Information shapes markets and drives decisions. It's not just individuals, however.

Entire industries are increasing their reliance on digital technology. The "fourth industrial revolution" – Industry 4.0 – is about connectivity, and it brings together many innovations we can already see in action and which are expected to have enormous implications for any industry: machine learning, artificial intelligence, Internet of things, blockchain, big data, automation, robotics, sensors, etc.

In a recent survey, almost 70% of our customers indicated that these new technologies will play an important role for their organizations.

Today, we have more knowledge about products, industries, and supply chains than ever before – and this has exposed just how complex they are. To survive and thrive, organizations need the ability to adjust quickly and work collaboratively. No organization can become "circular", "digital", or "sustainable" on its own. For a typical vehicle produced today, more than half of parts and components are produced by the supply chain.

Consequently, to ensure that a product is *ethical* and *carbon neutral*, companies must work very closely together and share more data than ever. Interestingly, the need for more collaboration has increased the speed of technology adoption to enable value chains manage the complete product life cycle, and account for everything that matters.

Conclusions

iPoint started in 2001, riding the waves of conquering material and substance compliance challenges. We have been growing with our customers to manage ever-changing, more stringent, and new types of regulations. iPoint has been managing more exciting and challenging sustainability requirements in the new circular economy framework. We have accumulated vast technical knowledge and expertise and developed many products and solutions for our customers in various industries. We are eager to work with our existing and new customers and embrace future opportunities.

We cordially invite you to leverage iPoint's ever-growing ecosystem to work together throughout the supply chain, increase resilience, create shared value, and use cutting-edge technologies to secure a circular, sustainable world for future generations.

List of abbreviations

3TG	Tin, Tungsten, Tantalum, and Gold
ACEA	European Automobile Manufacturers Association (French: Association des Constructeurs Européens d'Automobiles)
CAHRA	Conflict-Affected and High-Risk Area
CMRT	Conflict Minerals Reporting Template
ECHA	European Chemicals Agency
EHS	Environment Health & Safety
ELV	End of Life Vehicles Directive (EU Directive 2000/53/EC)
EPA	Environmental Protection Agency (USA)
ESG	Environment, Social & Corporate Governance
GADSL	Global Automotive Declarable Substance List
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
IMDS	International Material Data System
iPCA	iPoint Compliance App / Agent
NGO	Non-Governmental Organization
OEM	Original Equipment Manufacturer
OSHA	Occupational Health and Safety Act / Occupational Health and Safety Administration
POP	Persistent Organic Pollution
REACH	Registration, Evaluation, Autorisation and Restriction of Chemicals (EU Regulation (EC) No 1907/2006)
RRR	Reusability, Recyclability, Recoverability (EU Directive 2005/64/EC)
SCIP	Database for information on **S**ubstances of **C**oncern **I**n articles as such or in complex objects (**P**roducts) established under the Waste Framework Directive (WFD)
SCP	Safer Consumer Products (California)
SDG	United Nations Sustainable Development Goal(s)
SDS	Safety Data Sheet
SVHC	Substance of Very High Concern
TSCA	Toxic Substance Control Act (USA)
UNEP	United Nations Environment Programme
WFD	Waste Framework Directive

About the authors

Maroye Marinkovic is the Product Innovation Manager at iPoint, where he brings in his skills as a solution designer, digital strategist, and a communicator with a passion for improving sustainability, efficiency, and compliance across value chains.

Based in Melbourne, Australia, he has more than 10 years of experience in conceptualizing, designing, and implementing enterprise compliance, sustainability, and risk management software solutions.

Maroye's specializations include chemicals management, platform design, blockchain solution design, circular economy, and business strategy.

Dr. Bing Xu joined iPoint in Ann Arbor, Michigan, at the North America main office in 2019 as Director of Business Innovation. In this role, he supports iPoint's customers in different industries with their material compliance programs as well as their sustainability, circular economy, and digital twin projects, to integrate material compliance programs into their core product development processes and reduce non-compliance risks and improve engineering efficiency.

Before joining iPoint, Dr. Xu was Ford Motor Company's Global Materials Compliance Program Manager. Spearheading Ford's Global Materials Management program in early 1997, he was one of the original OEM members who developed and launched the International Data Management System (IMDS) for the automotive industry in 2000. He was Ford's global attribute leader for material/substance compliance and material life cycle management, and a member of Ford's Sustainability Council, managing both internal compliance and external suppliers' compliance. He also led Ford's cross-functional teams and developed various material compliance-related processes and IT tools for Ford since 1997. Furthermore, Dr. Xu was the owner of Ford's Restrictive Substances Management Standard (RSMS) and the owner of the Ford's internal material/substance compliance processes/tools.

He has served as chair and co-chair in several committees of leading industry organizations and work groups, such as the US Automotive Industry Action Group (AIAG)'s Chemical Management Advisory Group, the United States Council for Automotive Research (USCAR)'s Substances of Concern Group, the Global Automotive Declarable Substance List (GADSL)'s Steering Group; and he has supported projects of the US Environmental Protection Agency (EPA) on Alternative Assessments, and TSCA industrial data collection and evaluations. A recognized and highly respected expert of the automotive industry, he has been invited to speak at many conferences and forums hosted by different industries and governmental agencies, e.g., Electronics, Building Materials, Heavy Machinery, Chemicals, Apparel, Home Appliances, California Safer Consumer Products and Alternative Assessment conferences/workshops, and SAE US Government Industry Meeting.

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