



JORDAN NATIONAL STANDARDIZATION STRATEGY

**Draft v.11.2 – 19 July
2022**

based on version 11 Circulating version
July 2022 19 –Version 11.2

Table of Contents

Background.....	2
The Jordan Standards and Metrology Organization (JSMO) in brief.....	3
Objectives and approach.....	4
Motivations, Goals and Benefits	4
Methodology	4
Development process.....	5
JSMO NSS Task force	5
Information sources	6
Stakeholder consultation.....	6
Finalization	6
Priority sectors.....	6
Selection, justification, planned actions.....	6
Energy.....	8
Food Industries	11
Water.....	14
Manufacturing	18
Common challenges for the manufacturing sector and outline of actions to address them	19
Overview of manufacturing sub-sectors and outline of priorities for standardization	19
Manufacture of chemical, pharmaceutical and other products	19
Other selected manufacture sub-sectors	24
Materials & Extraction of materials	26
Transport and road safety	27
Construction	28
Information and Communication Technologies	31
Activities covering other sectors	35
Responding to diversified stakeholder needs	35
Horizontal themes	36
Facilitating doing business in Jordan.....	36
Promoting and supporting the participation of stakeholders in standards development.....	36
Optimize participation in international standards development and collaboration with other standards organization.....	37
Technological and organizational improvements	38
Support the implementation of standards.....	38
Draft implementation plan.....	39

Background

Following important economic and social achievements in the period 2001-2010, Jordan's economic growth has been stagnating in the following decade. The country has then been severely hit by the COVID-19 crises, which came on top of significant challenges facing the country.

To address these challenges, the Government, its Ministries and specialized agencies, with the support of many organizations engaged in international cooperation, have approved general and sectorial development strategies and plans, aiming to support economic development, social progress and to provide new opportunities for all people in Jordan.

The strategic directions indicated in these authoritative publications cover a variety of aspects, including subjects (such as macroeconomic and financial policies) that are not directly relevant for the organizations that in Jordan constitute the Quality Infrastructure¹ and their activities.

However, many of the strategic priorities highlighted in those publications are of direct and substantial interest for standardization and the other components of the QI. These concern, above all, priority sectors – with related plans and targets aiming to address Jordan's key challenges – where standardization and other QI services (notably conformity assessment) can directly contribute by collecting, systematizing and disseminating codified knowledge regarding products, processes, services and professions, and to promote the implementation of good practices by various private and public sector actors.

They also concern horizontal issues where the Jordan Standards and Metrology Organization (JSMO), in collaboration with other government entities, can provide important contributions – for example, making easier to do business in Jordan by simplifying the regulatory requirements and removing administrative burdens for companies (without compromising citizens' health and safety and protection of the environment), or using digital technologies and organizational improvements to support and increase participation of stakeholders in standards development, to facilitate the use of standards, and more.

That said, it is essential to recall that standardization is a complex and costly proposition and resources are limited. A National Standardization Strategy is an important instrument to identify priorities for standardization activities clearly aligned with those of the country, and to give clear directions on how to set targets and allocate resources consistently with strategic objectives.

¹ Quality Infrastructure (QI) is a “system that combines initiatives, institutions, organizations (public and private), activities and people. It includes the policies, relevant legal and regulatory framework, and practices needed to support and enhance the quality, safety and environmental soundness of goods, services and processes. It is required for the effective operation of domestic markets, and its international recognition is important to establish its credibility in local and foreign markets. QI is a critical element in promoting and sustaining economic development, as well as environmental and social wellbeing. It relies on metrology, standardization, accreditation, conformity assessment, and market surveillance.” (IQInet, 2018). In Jordan, the institutions that constitute the National QI are: JNMI (metrology); JSMO (standards, and conformity assessment of industrial products); JAS-AU (accreditation); other government bodies responsible for CA in specific sectors – i.e. JFDA (food and pharmaceutical), Ministry of Agriculture (live animals and plants), the Jordan Telecommunication Commission (telecommunication products); and private sector CABs.

The Jordan Standards and Metrology Organization (JSMO) in brief

The Jordan Standards and Metrology Organization (JSMO) is a public Organization established in accordance with the Law No. 22 for the Year 2000 and its amendments.

According to the Law, the primary objectives pursued by JSMO are:

- Adopting a national system for standards and metrology in accordance with international practices
- Keeping pace with scientific and technical developments in the fields of standards, metrology and conformity assessment
- Ensuring the health and safety of the Jordanian inhabitants and protection of the environment by making sure that goods, products and services are in compliance with the technical regulations adopted by JSMO for this purpose
- Ensuring the quality of national goods, products and services through the adoption of appropriate Jordanian standards in order to enhance the competitiveness in the local and international markets and thus support the national economy

Standardization is one of the core activities of JSMO, undertaken by its Standardization Department. Key activities concern:

- Issuing standards, technical regulations (under the mandate of competent Authorities), and other normative documents, and monitoring their correct application
- Adopting international or regional standards, guides and other documents that contribute to regulating the local market and providing safe products
- Providing technical consultations that meets the needs of the service recipients

The Standardization Department consists of seven Divisions, comprising: Engineering industries (civil, mechanics, and electrical engineering), Chemical industries, Food industries, Standards editing and follow-up, Technical consultations and studies, Technical Regulation preparation, and the Inquiry point division.

JSMO manages a portfolio of **2500 published standards** and **724 regulations**, developed by a technical structure comprising **80 technical committees**, whose work is based on the contribution of hundreds of experts from a broad variety of public and private organizations and academia.

JSMO is extensively involved in the work of International and Regional standards organizations, ensuring access to state-of-the-art knowledge essential for many Jordanian sectors and activities, and allowing contributing with inputs on issues affecting primary Jordanian's interests.

The current status of JSMO's membership in International/regional and sectorial standardization bodies is highlighted below:

Organization	P- member TCs	O- member TCs
ISO (full membership)	50	19
IEC (association membership)	3	1
CEN/ CENELEC (companion membership)	11	
ASTM	10	
SMIIC	8	8
ADISMO	13	

In relation to JSMO's international activities, it is worth noting the adoption, in Arabic, of the international standard ISO 45001/2018 for occupational safety and health management systems and the usage guide as a Jordanian Standard. An awareness document regarding the same has been developed by JSMO in Arabic and published on the ISO website, other than on JSMO's website.

Objectives and approach

Motivations, Goals and Benefits

Standardization brings significant benefits, contributing to economic development and social progress. Just to give an idea, standardization allows organizations to improve their processes, increasing productivity and reducing costs. It helps organizations to set-up and manage systems aiming to increase the quality of products and services. It provides guidance on how to meet requirements and expectations of customers for domestic and export markets. It supports the dissemination of rules and good practices to ensure that health and safety requirements of products and activities are met, and to support environmental protection.

However, developing, disseminating and supporting the adoption of standards is a complex and costly proposition, requiring the use of limited human and financial resources.

For this reason, JSMO has made an effort to identify and set priorities for standardization in Jordan (over a reasonable timeframe) and is in the process of planning activities and allocating resources to address such priorities.

The Jordan National Standardization Strategy is the framework adopted to address consistently these matters. The NSS allows to:

- **explicitly align standardization priorities with national priorities** (concerning economic development, social progress, environmental protection)
- communicate clearly and transparently with stakeholders, with a view to obtain support on strategic directions, but keeping a balance between overall national priorities and specific, important stakeholders' needs
- support, through an adequate implementation plan, the optimal use of available resources by:
 - o focusing on national priorities
 - o planning and applying efficient and effective choices of standards development options
 - o applying rigorous monitoring and evaluation methods following a continual improvement philosophy

The NSS also helps to highlight the importance of standardization for the country and the specific role of JSMO. Its development process also provides an important opportunity to reach-out to decision-makers and key stakeholders, fostering their understanding of standardization and how it can provide significant benefits to the country and their respective organizations.

Methodology

The development of the draft NSS has followed the methodology outlined below.

1. A number of authoritative source documents have been selected. These documents include strategies and economic development plans developed by the Jordanian Government (under the responsibility of the Prime Minister or of specific Ministers) and other entities, notably key

international partners. The most important among them, some of which have general scope and other are sector focused, are listed under the section “information sources”.

2. These documents have been reviewed carefully, aiming to identify and analyze the set of national priorities indicated therein: including those concerning economic sectors (with specific goals and issues to be addressed) and those concerning cross-cutting, horizontal issues.
3. These priorities have been further analyzed to identify to what extent, and in case how, standardization activities (along with other QI services, notably conformity assessment) could provide a useful contribution. An additional effort has been made to identify specific subject areas for standardization that are deemed to be most important in relation to the set of national priorities.
4. A review/assessment of JSMO’s portfolio of publications and ongoing activities has then been performed (along with a review of the existing technical structure, i.e. JSMO’s standardization departments and technical committees managed by them) with a view to further refine the selection of activities to be pursued – including possibly specific standards projects, or areas to be investigated to identify/determine specific standards projects.
5. A tentative implementation plan (with a three-year timeframe) is under development, aiming to evaluate the resources required to implement the NSS and to assess the feasibility – taking into account that not all the available resources can be allocated to new activities indicated in the NSS: some of them need to support the implementation of the existing projects’ pipeline, and a certain amount of resources needs to be maintained for possible future activities with character of urgency, that could be requested by government or key stakeholders.
6. **A stakeholder consultation is in preparation** (it will include the draft version of the NSS, with a questionnaire presenting structured questions and allowing open comments). The objective is to present the draft version of the NSS and to capture feed-back regarding its approach, general structure and proposed priority areas, as well as specific comments or recommendations regarding the modification of activities included in the plan, or additional sectorial perspectives of specific priority projects to be considered and possibly included in the NSS.
7. Stakeholder’s feed-back will be carefully analyzed and a final version of the NSS will be developed **(in consultation with representative of the parent Ministry?)**

Development process

JSMO NSS Task force

The Task force team consisted of representatives of the sectorial fields in the Standardization department, led by the head of the Engineering Industries Department, as follows:

- Engineering industries (mechanical engineering sector, civil engineering sector, electrical engineering sector)
- Food Industry
- Chemical industries

The representatives of each sector ensure that the necessary information is collected about their sectors in cooperation with the secretaries of the technical committees in the Standardization Department.

Information sources

- Country Development Cooperation Strategy (CDCS) 2020-2025
- Energy Strategy 2020-2030
- Government's Economic Priorities Program 2021-2023
- Jordan 2025 ' A national Vision and strategy
- Jordan Economic Growth Plan 2018 – 2022
- The Government's Economic Work Priorities Program (2021-2023)
- "World Food Program" Jordan country strategic plan (2020–2022)
- Reports published by Jordan Chamber of Industry
- The National Food Security Strategy 2021-2030
- National Water Strategy (NWS) 2016-2025

Stakeholder consultation

Finalization

Approach to be described later – last step of the process

Priority sectors

Selection, justification, planned actions

Following the indications of the primary information sources – and the approach outlined in the methodology section – a list of priority sectors has been identified.

It includes:

- **Energy, Food and Agriculture and Water.** All the publications with general scope (along with the sector-specific ones) indicate the vital role of these sectors in terms of economic, social and environmental factors. Energy, Food and Water security (which, by the way, are substantially interconnected) are indispensable to support the well-being of Jordanian citizens and a prerequisite for other actions promoting economic and social development. A specific section dedicated to each of these three highest priority areas is provided below.
- **Manufacturing,** i.e. supporting and promoting the growth of this sector and the ability of Jordanian companies to meet domestic and export markets requirements, is also indicated as a high priority. The reference documents do not enter in much more detail on prioritizing sub-sectors belonging to the manufacturing sector. This effort has been done by the NSS task force, considering aspects such as market size, volume of export, health and safety priorities, past growth trends and potential for future development. Based on this analysis, a certain number of sub-sectors have been selected, and grouped under two main categories: Chemical and

pharmaceutical; and Other selected manufacturing sub-sectors. They are presented below, after an introduction on common challenges regarding the entire manufacturing sector.

- **Transport and Construction.** These sectors are also identified in the reference documents as priority sectors – however, considering the standardization perspective (and particularly JSMO’s experience and relationships with stakeholders), the task force has decided to select a limited set of specific activities regarding these sectors to be part of the NSS. They are also presented below.
- **Information and Communication Technologies:** Jordan’s ICT has developed into one of the leading sectors in the region and it is listed as a priority sector in all the reference publications. However, until now, stakeholders have not requested JSMO to address ICTs standardization in a structured and focused way: in the framework of the NSS a specific action is proposed, regarding the engagement of stakeholders and the organizations of in-depth interactions with them. Based on the results, priority areas for standardization in the ICT sector can be selected and the NSS amended accordingly.
- **Environmental challenges:** they concern a broad variety of issues affecting, in various ways, all the economic sectors and addressing them is critical for making progress against the Sustainable Development Goals in Jordan. Actions related to environmental challenges are already included in some of the priority sectors listed above (for example, renewable energy and energy efficiency, water conservations, green buildings: actions in these areas contribute significantly to address environmental challenges). However, considering the key reference documents (in particular the Ministry of Environment Strategy 2020-2022) and the possible contributions of standardization, two priority subject areas have been selected and are included as the last entry of this chapter: , Waste Management and GHG emissions.

The Priority sectors outlined above are presented in the following sections. **For each of them are provided:**

- a background (describing in summary characteristics and challenges regarding the sector)
- a summary of the national strategic objectives (as per the reference documents)
- indication of relevant stakeholders and their needs
- proposed key areas/activities where standardization can provide a significant contribution
- if possible and relevant, indication of specific existing standards or standards under development (from ISO, IEC, other organizations) that could be of particular interest for Jordan – or new possible standards projects.

In addition, a review of the portfolio of existing JSMO publication and ongoing projects is underway, aiming to identify if, and in case to what extent, they are covering the priorities identified for the NSS. This analysis is essential for the implementation plan that will guide JSMO’s standardization activities over the 3-year period 2023-2025.

Energy

Introduction:

Energy is necessary for economic growth, social development, and improved quality of life worldwide. Energy consumption grows roughly at a rate of 1% and 5% per year in developed countries and developing countries, respectively. Fluctuating oil prices put pressure on the world's economy, making the search for alternative clean energy sources a priority for many countries. In addition to the necessity of shifting the current environmental and energy policies towards the development and implementation of environmentally friendly renewable energy technologies at affordable prices.

Jordan challenges in Energy sector:

Jordan meets nearly all of its energy needs by importing oil and gas, which constitute nearly **one-fifth** of its gross domestic product (**GDP**), leaving it vulnerable to variations in fuel prices. The percentage of the crude oil and natural gas used in energy production for the year 2020, **was 58% and 21%** respectively. Jordan's power demand is also growing due to the flux of 750,000 Syrian refugees entering the country over the last seven years which make the development of alternative energy sources a national priority for Jordan government. According to Energy and Minerals regulatory Commission, there are around **467** companies working in the Energy sector, with a large number of them involved in renewable energy.

Government Initiatives:

Longer-term government initiatives to meet future energy demand, include increased renewable energy share, improved energy efficiency, development of alternative energy supplies, financial incentives and tax exemption, which combined will promote clean energy supplying most of Jordan's growing energy demands.

The updated Master Strategy for the Energy Sector 2020-2030, developed by the Ministry of Energy and Mineral Resources (MEMR), calls for a sustainable future energy supply, diversification of the national energy mix, increased dependency on the share of domestic energy resources, enhanced energy security, and reduced energy dependence and cost of electricity supply.

The strategy targets:

- 31% share for renewables in total power generation capacity and 14% of the total energy mix by 2030.
- 9% increase on the energy efficiency of all sectors in 2030 compared to 2018, and that of the water sector by 15 percent in 2025.
- 10% reducing of carbon emissions in 2030.

The government has taken many initiatives to make investments in the renewable energy sector appealing. A new energy fund, Jordan Renewable Energy & Energy Efficiency Fund (JREEEF), has been established to support renewable energy facilities, infrastructure development. It helps farmers, households, industries, hotels, mosques, churches, schools and communities optimize their energy consumption and use more renewable power.

Tax incentives and customs exemptions are also provided to eliminate any barriers to the extensive use of renewable technologies and energy efficiency measures in all aspects. Tax incentives policies were enhanced by passing the "Renewable Energy Law" by including 100% tax exemption for ten years when investing in renewable energy construction in certain areas where socio-economic developments are needed.

Investors with renewable energy projects can negotiate directly with the Energy Ministry. Accelerating the rate of investments in the renewable energy sector and the legislation allows local and international firms to negotiate directly with the ministry, avoiding long competitive bidding processes. In addition to the law, all electricity generated from renewable energy sources will be sold directly to the National Electric Power Company (NEPCO). Citizens are also allowed to sell electricity generated by solar power or wind turbines back to their electricity provider.

The target groups of stakeholders for the energy sector:

- a. **Public authorities** (MEMR, other Ministries, EMRC)
- b. **Companies responsible** for generation and distribution/transmission of electricity (NEPCO, SEPCO, GEPCO, various independent power producers (IPPs), as well as JEPCO, IDECO, EDCO)
- c. **Producers and importers of equipment** for RE (solar panels, connectors, etc.) as well as of equipment of particular interest for EE (e.g. electrical appliances)
- d. **Service providers** for the RE and EE fields
- e. **Commercial entities, Consumers and communities** interested in renewable energy projects for self-consumption (either connected to the grid or off-grid solutions)
- f. **All energy end-user sectors** (Households/buildings, Transport, Industry, Services, Government) interested in the implementation of energy-efficiency measures.

Proposed priority areas

The key priority areas under the energy sector where standardization can provide a significant contribution are outlined below:

- 1) Renewable energy as the core component of the energy diversification agenda, contributing to increase the share of national resources, and to reduce costs and GHG emissions.
- 2) Horizontal Energy management and auditing systems (applicable to buildings, industry production processes and transport) and Energy Efficiency of household electrical appliances, through eco design and labeling. Energy Efficiency is considered a primary driver for addressing energy consumption, instrumental to reduce the cost of energy for the national economy and to reduce GHG emissions.

A specific issue particularly important in Jordan, concerns central cooling devices (central air conditioners and commercial and industrial refrigerators) using refrigerants that are less environmentally harmful. To address this issue new technical regulations and standards are needed.

Ongoing and Future Projects :

- 1) IFC project related to transposition of European directives for Eco-design and labeling of Household energy devices.
- 2) Cool UP project to reduce power consumption of AC systems in Jordan and using Environment-friendly gases. It is funded by Germany Ministry of Environment and in cooperation with Guide house Energy Germany GmbH, Jordan Ministry of Environment and Royal Scientifics Society.
- 3) UN –ESCWA project for improving Energy Efficiency of the Domestic and Service sectors in Arab countries in cooperation with Jordan Ministry of Energy and Mineral Resources.
- 4) UN-ESCO Project (UN Educational Scientific and Cultural Organization).

Contribution Of Standards:

Mandatory requirements, voluntary standardization and related compliance procedures address a broad variety of aspects for energy sector are very crucial to maintain a sustainable and renewable energy market.

a) Renewable Energy-types of Standards:

1. Standards covering the design, construction/installation and operation of renewable energy systems – notably solar PV systems and wind turbines. Usually , these standards , are complemented by certifications schemes aiming to ensure safety, reliability and quality of installations.

The leading provider of international standards in this field is the IEC – for wind turbines, with the IEC 61400 standards series, and for solar PV with the IEC 61000 and IEC 62000 standards series; along with the IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications (IECRE System).

2. Standards and guidance for off-grid or micro-grid PV systems to cover the small-scale, self-consuming users within the country rural areas, city suburbs and refugees camps. Various deliverables are available from IEC and Lighting Global, the World Bank Group’s platform supporting sustainable growth of the international off-grid solar market.
3. Standards for the Smart grid. They concern the organizations responsible for distributing and managing energy from the generation sources to the final consumers. Key standards frameworks are available from the IEC and from organizations from leading economies. Smart grids are experiencing today substantial evolution towards :
 - Integrating more intermittent renewables,
 - Relying on full digitalization to handle sophisticated data management services to increase the efficiency of grid operations and use of infrastructure, and cyber security to ensure resilience of networks and continuity of service
 - Using smart meters and other devices to foster energy efficiency
4. Standards and conformity assessment schemes for companies and professionals, concerning the installation, operation and maintenance services for renewable energy systems, and notably solar PV systems.

b) Energy efficiency- types of Standards:

1. Energy management standards, standards for calculating and reporting energy savings and energy performance of projects, organizations and more. The ISO 50000 series (along with a selection of ISO 177xx) provide a solid foundation in this area.

2. Energy efficiency standards and related frameworks addressing a variety of “energy-using products” (including, in particular, products for Lighting, HVAC (heating, ventilation, air conditioning), Electrical appliances (refrigerators, washing machines, etc.), Consumer electronics and IT, Electrical motors. These Standards cover a variety of aspects such as:

- Product design to improve the energy efficiency of products.
- Energy labeling requirements
- Conformity assessment schemes for Energy audits and certifications
- Supporting the implementation of government policies.

Food Industries

Agriculture and food production are strictly interrelated fields. However, considering the specificity of the Jordanian environment where the Ministry of Agriculture takes the responsibility for organizing the agricultural sector in line with national goals to contribute to achieving sustainable rural development, agricultural aspects are not addressed in this document.

In what follows we will consider Food Products, that are under the responsibility of JSMO and, in particular, of the standardization department's Food industries Division, whose mission concerns preparing Jordanian standards and other deliverables in line with international, regional and national standards for Food Products and production processes. It should be underlined that cooperation between JSMO and Ministry of Agriculture is of great importance.

Introduction

Food systems in Jordan are characterized by fragility and weakness, as Jordan is located in an arid or semi-arid region with low and fluctuating rainfall from year to year, in addition to limited renewable ground water and Jordan's heavy dependence on imported food and agricultural inputs.

Jordan exports certain agricultural and food commodities, the most important of which are fresh fruits and vegetables. The Gulf countries and Iraq, and to a lesser extent some European countries, are the most important export destinations, while Jordan depends heavily on imports that meet its needs of other commodities such as wheat, barley, corn, rice, sugar, cooking oil and red meat. The value of food and live animal imports in 2018 amounted to about 3.418 million USD, while the value of food and live animal exports amounted to 917 million USD, and the food trade balance deficit in the same year amounted to 2.501 million USD, which makes Jordan vulnerable to fluctuations in global market prices.

Jordan challenges in food sector:

Jordan has efficient and competitive food industries, and it is estimated that the food processing sector and related sectors represent about 50% of the local market share. Jordan has 11 food sub-sectors, including bakeries, sweets, dairy, meat, fruits and vegetables. The food industry, with 2.645 companies, constitutes 15% of the total number of industrial establishments in Jordan. The regional Arab markets are still the main export market for Jordan, as they represent more than 75% of its processed foods exports. There is great potential to improve and increase the efficiency of the food value chain of the main food products in all its stages i.e. production, trade, distribution and consumption, and this will be achieved mainly through the adoption of new technologies, innovative methods and good practices such as hydroponics, efficient irrigation systems and quality sheep breeding. The improvements in the value chain will contribute to improving the productivity and competitiveness of the Jordanian food industries not only in the local market but also in neighboring and regional markets. Over time, the agro-industrial sector should get stronger, covering domestic demand and developing a greater potential for growth. With the exception of importing wheat and barley, the private sector produces, imports and distributes all agricultural and food commodities, while the Ministry of Industry, Trade and Supply sells wheat to mills, barley and bran to livestock owners at subsidized prices.

Food handling and processing in Jordan suffers from:

- i) limited post-harvest and post-production services;
- ii) weak investments and a supportive environment, especially foreign investments;
- iii) non-tariff legal barriers;
- iv) a volatile tax framework;
- v) Recurring taxes and additional fees on trade, in addition to inadequate infrastructure, services, and trade and industry policies. Inconsistent.

Government Initiatives:

The National Food Security Strategy 2021-2030 provides the overall objectives and the description of the set of actions, with guidance on their implementation, required to achieve food security. The strategy aims to:

- Develop and implement regulatory and policy frameworks that will facilitate growth and prosperity
- Assist Jordan to realize its role as a strategic regional hub for food security, enhancing Jordan’s role as a center for peace and stability in the region
- Achieve efficient utilization of available resources, potentials, and opportunities
- Minimize food loss and waste and provide proper targeting and monitoring of progress gauged against agreed-upon indicators
- Accelerate the progress towards achieving relevant SDGs targets and meet Jordan’s commitments.

The Economic Growth Plan (2018-2022) highlighted stable food security as a major pillar supporting economic growth. It identified the stability of food supply and free markets, with the required regulating mechanisms, as the two main drivers of stability of food security. The plan considered the following priorities to enhance the internal food trade and supply sector: i) utilization of monitoring mechanisms to maintain market stability; ii) promotion of free market competition, with regulations to prevent over-pricing; iii) protection of national production; iv) maintenance of a strategic reserve of essential foods to improve self-sufficiency; v) minimization of waste in the strategic reserve; vi) protection of consumers; and vii) strengthening of existing market infrastructures, and coordination of initiatives for achieving and maintaining food security

Stakeholders for the food sector:

- a. **Public authorities** (Ministry of Agriculture, Ministry of trade and industries, Food and drug administration, Jordan Industry chamber, Jordan trade chamber)
- b. **Consumers** of food products
- c. **Small holders** active within the domestic market. The vast majority of them can be considered part of the “informal sector”: however, they are numerous and have an important role to ensuring food security for Jordanian people (as well as employment) – particularly in rural areas, but also in areas close to cities or refugees’ camps.
- d. **SMEs** linked to local farmers (or that combine farming with food production activities) serving local markets or the national market
- e. **Companies able** (or potentially able) **to export** food processed products (primarily to the ME and EU markets): today they are a relatively small group, but potentially important for trade and development

Proposed priority areas

The following are the key priority areas under the food sector where standardization can provide a significant contribution:

- ✓ Food safety
- ✓ Horizontal support to the Food industry, which include health, safety , management and quality of food products
- ✓ Support production and export of olive oil and dates, two of the highest value Jordanian food products

Contribution Of Standards:

Mandatory requirements, voluntary standardization and related compliance procedures address a broad variety of aspects for the food sector.

For example, standards provide:

- requirements and test methods enabling the labeling of food products, the determination of pesticide residues limit, of veterinary drugs residues limits, and of microbiological limits;
- criteria and methods to determine food shelf life, safety and potential benefits of food additives;
- Safety and performance requirements of food packaging, quality requirements for final products, and much more.

Jordanian standards shall be traceable to an international reference to insure harmonization with international standards, allowing products to comply with international market criteria and have access to regional and international markets.

The leading providers of international/regional standards in this field are Codex Alimentarius Commission, ISO and CEN (for European standards related to the EU regulatory framework).

Standards contribute to provide solutions for the food industry and we are proposing a characterization along three main dimensions:

- Health, safety and quality of food products, which we consider as our main strategic goal.
- Requirements for processing, production, packaging, storage and delivery of food products which need a continuous improvement.
- Denomination of food products and definition of ingredients; information on and labeling of food products; classification of origin; traceability; and so on – another dimension requiring continuous improvement.

Recommendations:

- Food safety management is a core issue and the ISO 22000 series of standards provides a broadly applied platform. It can be considered a central element of the standardization strategy for the food industrial sector – and it can be declined in various ways to meet the different needs of stakeholders.
- Coordinating with and contributing effectively to the Codex Alimentarius Commission (CAC), is also of utmost importance for the Jordanian food industry. Let's recall that the central element of the CAC, joint FAO/WHO Food Standards Program, covers:
 - General Principles of food hygiene practices,
 - guidance on the compositional requirements of foods and on general labeling of foods and the health or nutrient claims producers make on labels,
 - indication of Maximum Level (ML) for a contaminant to be legally permitted in a food or feed commodity,
 - indication of Maximum Residue Limits (MRLs) for pesticides in specific food items.

Future Plans:

Among the most prominent future plans for the advancement of the food industry sector, and for standards to have a role in it, particular importance is given to the program to improve rural livelihood opportunities.

Standards for food products can contribute in an indirect way, by helping to meet health and safety requirements. This will support and increase access of food produces from smallholders and informal producers to the domestic market, contributing, in addition, to reducing food waste by supporting safe storage and handling of food products. Standards and appropriate conformity assessment measures can also, in some cases, help to meet the more stringent food quality requirements of products suitable for export.

The program is particularly important for women and youth, who represent the main actors among smallholders.

Standards supporting improved practices (regarding harvesting, basic processing, storing and handling of food products) will help them to cater to their own needs and to sell surpluses, providing additional sources of income, employment and development. Many types of food products are potentially concerned, including vegetables, fruits, milk, eggs and honey.

Water

Background

Jordan is the second most water scarce country in the world. Jordan's annual renewable water resources are less than 100 m³ per person, significantly below the threshold of 500 m³ per person which defines severe water scarcity.

Despite that, Jordan has been able to achieve remarkable results on access to water: in fact more than 98% of the population has access to an improved water source, 93% to a safely-managed source and 86% to a piped network. The water distribution system is far from being perfect, though: in urban areas, water is usually available once a week, and less than once every two weeks in rural areas, with reduced frequency during the summer. Progress has also been made on sanitation, although there is significant room for improvement: 77.3% of existing sanitation systems are safely managed and only a third of schools have basic sanitation services.

Jordan gets its water from three sources; Groundwater, surface water (local and regional) from river flow and water collected in dams, and finally non-conventional water, which comes from desalinated water and treated wastewater. All of them are used to meet the demand from the population, agriculture, industry and livestock.

Among the previous sources, groundwater is of particular importance, as it constitutes a major source for all uses, especially drinking water.

Herein lies a significant problem, as groundwater basins are fine, as long as they do not exceed the "safe withdrawal" limit, which means that the amount withdrawn from the basin does not exceed the amount of regeneration, which comes mainly from rainwater and the flow of surface water into the ground. The limits of the "safe withdrawal" differ from one basin to another, according to the renewal process of each basin.

In the Kingdom, all water basins, with the exception of the Disi, and part of the Jafr basin, are renewable. The problem, however, is that the safe withdrawal limits have been exceeded in the overwhelming

majority, and unfairly. This has led to a dangerously low level of it. It even led to some government wells designated for drinking water, having completely dried up – including wells in the Hallabat and Almwaqar.

Jordan challenges in WATER sector

1. Increased water demands due to growth in population and in industrial and agricultural capacity.
2. High levels of non-revenue water (water leakage, illegal connections, meter losses), estimated at 52%, as well as the perception that water is not a scarce resource, also fueled by high levels of subsidies.
3. Climate change is expected to have a significant impact on Jordan, most likely leading to increased temperatures, variation in precipitation patterns, extreme weather events, and flash flooding. This will compromise the resilience of water and sanitation services making it more complex the achievement towards Sustainable Development Goal 6
4. The rapid depletion of subsurface water basins.

Government Initiatives:

The National Water Strategy (NWS) 2016-2025 provides the general framework for addressing Jordan's water challenges and covers the following strategic areas:

1. Implementation of an **Integrated Water Resources Management (IWRM)**;
2. Provision of adequate water, sewage and sanitation services.
3. Ability to provide water for irrigation, energy and other uses on a sustainable basis.
4. Sector information management and monitoring.

Among the strategic objectives described in the NWS the following ones are particularly important from the NSS perspective:

- ensuring **equitable and efficient water allocation** for all social and economic development needs in a sustainable manner
- focusing on **efficiencies in the use and conservation of water resources** for optimal social and economic benefits, including enhancement of shared water resources through trans boundary cooperation. The NWS also indicates that strategic water resources planning requires the development of efficiency standards and updated procedures for sector implementation.

The NWS is complemented by a Capital Investment Plan (CIP) that allocated investments (for the period 2016-2025) of about 4.5 billion JD to projects aiming to implement the strategy. Such projects are classified primarily² as:

- **Water Projects**, including all projects dedicated to water supply (creation of new bulk supply³ – in particular new bulk water conveyance systems; development of new water resources or expansion, improvement and upgrade of available ones; construction of new or rehabilitation of existing distribution networks, aiming to reduce NRW), and
- **Wastewater Projects**, including all projects aiming to provide access to sanitation or to upgrade already available systems and/or facilities – i.e. Rehabilitation and upgrade of existing collection systems that have been in use but are deteriorated; Expansion of access to sanitation services through the construction of new treatment and/or collection systems; Construction of new or upgrade of existing wastewater treatment plants.

² Other projects include those that would lead to energy efficiency gains for water supply and sanitation systems, and those addressing the Jordan responses to Syrian refugees' influx.

³ **Important:** a substantial share of the CIP budget (almost 2 billion JD) was allocated to **the Red Sea-Dead Sea (RSDS) conveyance project that has been cancelled in June 2021** – replaced by the **Aqaba-Amman water desalination and conveyance project** – the details of which we have not been able to consider for this document.

Standardization priorities for the WATER sector.

Considering all the above, standardization priorities can be summarized as follows:

- a) **Water Efficiency:** standards and conformity assessment procedures supporting water efficiency can provide a fundamental contribution to Jordan's NWS and implementation plans.
- b) **Water conservation:** water efficiency (listed above) is a key aspect of water conservation. In addition, standardization and metrology can provide other very important contributions, supporting the IRWM philosophy – particularly in relation to a multitude of quantitative and qualitative aspects of surface water and groundwater, needed for an in-depth knowledge of water resources and their management
- c) **Wastewater treatment:** addressing water pollution at its various sources is a critical aspect of sustainable water safety management: in this respect technical regulations, standards and conformity assessment have an essential role.
- d) **Water infrastructure:** Public and private investors can draw on the standards and conformity assessment services for information about materials and technology options for water infrastructure projects; on standards for measuring and testing fluid flow; and on guidelines for "quality water infrastructures"

Stakeholder groups

Based on the elements collected from the reference publications, the NSS may consider the following target groups of stakeholders for the water sector:

- a. **Public authorities** (MWI, other Ministries, Water Authorities)
- b. **Water utilities** managing the distribution of water, and wastewater treatment plants
- c. **Contractors** involved in water infrastructure projects
- d. **Producers and importers of equipment** for different uses of water:
 - a. Domestic
 - b. Infrastructure
 - c. Irrigation
- e. **Consumers and communities** (domestic water users)
- f. **Farmers** (users of water for irrigation)
- g. **Companies belonging to Industrial sectors**, in particular to the sectors that consume most water (i.e. textile, construction, food and beverage, energy and mining).

The target groups listed above have different requirements.

Coordination with the competent public authorities is clearly a top priority – aiming to define the specific role of standards (and technical regulations managed by JSMO) in support to the Jordanian regulatory framework for the sector.

Contribution Of Standards:

Overall water strategies, dams management, and infrastructure for drinking water and wastewater sanitations, are under the responsibility of the Ministry of Water and Irrigation, in cooperation with other related parties.

However, given the sensitivity of the water situation in Jordan, this requires continuous improvement of water management and water quality. JSMO can provide an important contribution ensuring the connection with global developments in this essential sector.

In this respect it should be noted that the activities of inspection bodies and of the accredited laboratories for water testing in Jordan are currently based on the "Book of Standard Methods for Water and

Wastewater Analysis" issued by the American Public Health Association (APHA) and not on international standards and guidelines issued by organizations such as. the International Organization for Standardization (ISO): however, we are in the process of transition toward ISO standards in this area.

Mandatory requirements, voluntary standardization and related compliance procedures address a broad variety of aspects for the water sector, as outlined below.

- a) **Water Efficiency:** standards and conformity assessment procedures supporting water efficiency cover primarily three broad areas:
 - 1) **equipment**, i.e., design, manufacturing and operation of water efficient devices, for different types of use – i.e., irrigation, domestic use/drinking water, industrial applications.
 - 2) **water management**, i.e. criteria and good practices regarding the use of water in a variety of contexts and the provision of water services by utilities (for drinking water, waste water and storm water)

A good reference for this subject is ISO TC/242, Drinking water, wastewater and storm water systems and services that has so far developed 21 standards covering various aspects of water management (particularly important is the horizontal standard **ISO 46001/2019, Water efficiency management systems** — Requirements with guidance for use).

- 3) **water footprint assessment**, i.e. methods and tools for assessing the “water footprint” of a product or a service, i.e. the volume of freshwater used to produce the product, measured over the full supply chain (which should be a multidimensional indicator, showing water consumption volumes by source and polluted volumes by type of pollution).

Among the leading standards/frameworks covering this field we can indicate the **Global Water Footprint Assessment Standard** of the Water Footprint Network (WFN) and ISO’s 14046:2014 Environmental management — Water footprint — Principles, requirements and guidelines, along with ISO 14073:2017 Environmental management — Water footprint — Illustrative examples on how to apply ISO 14046.

- b) **Water conservation:** standardization and metrology can provide important contributions for the **knowledge of water resources** (let’s recall that an in-depth knowledge of water resources is essential for the design and application of water policies, international agreements, regional, national and local development plans and restoration of water ecosystems).

Under this area should be considered international systems and initiatives such as **AQUASTAT**, FAO’s global water information system, which is the world’s most authoritative source on global water statistics. (Standardized data and presentation formats are essential to allow understanding and comparison, and AQUASTAT plays a key role in data and terminology harmonization)

- c) **Wastewater treatment.** In developed countries a comprehensive and complex set of national and regional regulations (and standards) have been developed to address water pollution by different sources, notably human (and other urban) waste, agricultural waste and industrial waste.

Recalling that standards for wastewater treatment exist **mainly at national or regional level**, some international references have been developed and their role would likely increase in the future. Among them it is worth noting:

- The **WHO Guidelines on sanitation and health** (2018), which aim to promote safe sanitation systems and practices in order to promote health. Among other, they provide recommendations regarding good practice actions for enabling safe sanitation service delivery, and principles for implementation of sanitation interventions
- **Standards from ISO/TC 275**, standardization of the methods for characterizing, categorizing, preparing, treating, recycling and managing sludge and products from urban wastewater collection systems and other.

d) Water infrastructure: Public and private investors can draw on the standards and conformity assessment services for information about materials and technology options for water infrastructure projects: International standards (complemented by regional and national standards whenever required) are usually available for **elements and common materials of water infrastructure projects**, including equipment such as pipes (PVC or concrete pipes), fittings and valves, materials such as precast concrete kerbs and chambers, structural elements such as aggregate pipe bedding, mass and structural concrete, base course asphalt and more. Standards for measuring and testing fluid flow (such as those of the **ISO 4064 series**) are also used by water plants, along with standards and metrological services used for the development and calibration of water meters and other devices used to measure a variety of parameters regarding water within conduits.

Manufacturing

Introduction:

The industrial sector plays a major role in contributing to economic and social development in terms of added value, export, employment, attraction of quality investments, access to global markets and promotion of the image and identity of Jordanian products. The industrial sector contributes directly to about a quarter of the national economy (25% of the gross domestic product) – a proportion that increases to about 40% if we consider the contribution of industry to other economic sectors.

General government initiatives for the manufacturing sector in Jordan are divided into two areas:

- **Development of Industry**

This strategic direction is focused on expanding the industrial manufacturing base, increasing available production capacity, enhancing the competitiveness of service sectors, providing an enabling business environment and creating job opportunities for Jordanians; all through building concrete and effective partnerships with the private sector. ⁷⁾

- **Trade promotion**

This is focused on growing foreign trade, boosting exports to established markets, opening promising new markets for exports, and reducing the trade balance deficit.

Considering the above, under this section we provide:

- a) first, an overview of horizontal issues: a description of challenges that are common to all Jordanian manufacturing sub-sectors and that can be addressed through standardization initiatives for the whole manufacturing sector, and
- b) second, a description of the most important manufacturing sub-sectors from the perspective of the NSS, highlighting the challenges facing them, how standardization can help to address them and then outlining the main priorities for standardization in those areas.

Common challenges for the manufacturing sector and outline of actions to address them

The analysis has identified several challenges that are, in general terms, common to all manufacturing sub-sectors, i.e.:

- The lack of sufficiently specialized technical laboratories to examine many products, in addition to the high costs of examining them.
- The lack of weakness of research and development departments, despite the great and important need for research and development in all manufacturing sub-sectors
- Lack of awareness of the quality and efficiency of the local product compared to the imported products
- The rise in the prices of raw materials and electricity, which affects production costs and reduces the competitiveness of Jordan industry
- Political and economic crises that surround the Arab region.

Standardization can contribute to address these challenges through:

- actions such as those listed under the following NSS section “**horizontal themes**”
- other actions, that may include:
 - strengthening the current process of collection of requirements from stakeholders;
 - setting-up strategic advisory groups – SAGs – for certain sectors/sub-sectors, aiming at identifying and justifying priorities;
 - strengthening collaboration with industry, government research centers and academia, highlighting the role of standardization in relation to the R&D process;
 - establishing links and collaboration with laboratories in other countries (e.g. leveraging participation in international technical committees in certain fields; etc.)

Overview of manufacturing sub-sectors and outline of priorities for standardization

Manufacture of chemical, pharmaceutical and other products

Introduction

This sector is one of the largest Jordanian industrial sub-sectors and one of the main pillars of the national economy, in terms of contribution to gross domestic product and Jordanian exports.

It is also useful to note that outputs from the sub-sectors grouped under “Chemical” are diversified and versatile and contribute to completing the production cycle of many other commercial and industrial goods.

Proposed priority areas:

i. Chemical and Cosmetic Industries

Key economic data⁴ regarding this sub-sector are presented in the table below:

year	% of export	Total export	Number of companies	Number of employees
2020	12.92	950.5 M JOD	692	14,467

This sub-sector is distinguished by its great ability to develop and innovate and by the multiplicity of uses of its products. In particular, intermediate products from this sub-sector contribute significantly to the medical, pharmaceutical and construction industries.

⁴ All data presented in this document are *JSMO elaboration on data from the Jordan Department of Statistics, the Jordan Chamber of Industry and the World Bank*

ii. Therapeutic Industries and Medical Supplies

Key economic data regarding this sub-sector are presented in the table below:

year	% of export	Total export	Number of companies	Number of employees
2020	9.46	695.5 M JOD	130	9,297

This is a pioneering sub-sector that started manufacturing in the early sixties and continued with providing distinguished products that became a symbol of the national industry. Jordan is considered a competitive regional center for manufacturing and selling medical products and medical supplies. Most of the production of local companies is exported to the Middle East countries and the Arab world.

The therapeutic industries and medical supplies sub-sector comprises the following products and services: medical and therapeutic materials, medicines, natural medical materials and preparations, medical and therapeutic disinfectants, laboratory reagents, medical devices and supplies, optical and audio devices and dental supplies, medical consumables in addition to any similar industries within this sub-sector.

iii. Packaging, Paper, Cardboard, Printing and Office Supplies Industry

Key economic data regarding this sub-sector are presented in the table below:

year	% of export	Total export	Number of companies	Number of employees
2020	2.16	158.8 M JOD	930	11,390

This sub-sector, and particularly the packaging industry, represents the link between the product and the consumer and is considered an integrative sub-sectors for all other industrial sectors – with food, pharmaceutical, and chemical industries in leading positions.

Packaging, print, and design quality contribute to product promotion.

iv. Plastic and Rubber Industries

Key economic data regarding this sub-sector are presented in the table below:

year	% of export	Total export	Number of companies	Number of employees
2020	3.02	222.3 M JOD	9,315	1,442

The plastic and rubber products industry is considered one of the most important industries, given the multiple uses of its products, that impact all aspects of practical life.

The products of this industry are witnessing an increasing demand because of the necessity of using them for various purposes, including a broad variety of consumer goods as well as raw materials or parts for many other products (e.g. textiles, vehicles, construction, etc.)

v. Leather and Garment Industries

Key economic data regarding this sub-sector are presented in the table below:

year	% of export	Total export	Number of companies	Number of employees
2020	22.52	1656 M JOD	1,182	76,098

Jordan attaches special importance to the leather and garment sub-sector for its continued growth and substantial contribution to export, employment and social development.

The sector ranked first in terms of number of workers within the ten industrial sectors.⁵

vi. Halal products

Halal is an Arabic word meaning lawful or permitted. The opposite of halal is haram, which means unlawful or prohibited. Halal and haram are universal terms that apply to all facets of life. These terms are commonly used in the field of manufacturing in relation to cosmetics, personal care products, pharmaceuticals, and food contact materials. While many things are clearly halal or haram, there are some things that are not clear. Further information is needed to categorize them as halal or haram. Such items are often referred to as mashbooh, which means doubtful or questionable.

Because for the high demand in the Islamic region offering Halal-certified products allows Muslim consumers to be confident that the products they use are in alignment with their culture and beliefs.

The target groups of stakeholders for the Manufacturing/chemical sector:

Based on the elements collected from the reference publications, the groups of stakeholders for the chemical sector are listed below:

a. Governmental authorities (ministry of trade and industry & Supply, Labor, Agriculture, Tourism, Health, Environment, other Ministries, etc.)

b. Factories (Chemical industries, etc.)

c. Suppliers and vendors of chemicals for different industries and uses.

d. Associations (Jordanian Engineers Association, National Consumer Protection Association, etc.)

e. Consumers.

The target groups listed above have different requirements.

Coordination with the competent public authorities is clearly a top priority – aiming to define the specific role of standards (and technical regulations managed by JSMO) in support to the Jordanian regulatory framework for the sector.

Contribution of standardization:

Mandatory requirements, voluntary standardization and related compliance procedures address a broad variety of aspects for the Manufacture of chemical, pharmaceutical and other products included in this sector.

With the exception of Halal products, all the sectors described above are supported by standardization activities managed by JSMO since several years – from a strategic perspective what is important is to maintain a continual improvement approach, following industry trends, domestic and target markets' and evolving regulatory requirements, and to respond to them appropriately.

Consequently, in what follows are outlined:

- New developments needed to target Halal products
- Subject areas of particular interest for the other sub-sectors, to be addressed through a continual improvement philosophy

A. New developing sector

Halal products:

1. Halal cosmetics:

Standardization in the field of cosmetics products categories in general, with focus on fulfillment of halal requirements, aims to improve both safety and quality parameters and to satisfy needs of main stakeholders (industry, government and consumers).

Therefore, the most important benefit expected from the work of SMIIC/TC 2 Halal Cosmetic, is to ensure that these products conform to Islamic law and respect quality and safety requirements. It is also highly

⁵ <https://www.jci.org.jo/Chamber/Sector/80069/Leather-and-Garment-Industries-Sector>

desirable for JSMO to appoint a Chairperson in SMIIC/TC 2, the committee responsible for this subject matter.

2. Halal Products- Usage of Animal Bone, Skin and Hair:

Standardization in the field of leather and tanning material in compliance with Islamic jurisprudential rules and ethics, whenever needed.

Therefore, the most important benefit expected from the work of SMIIC/TC 8 Leather and Tanning Material, is to ensure that these products conform to Islamic law and respect quality and safety requirements. JSMO should work actively as a P-member in this TC.

B. Subject areas addressed through continual improvement

1. Leather and Garment Industries:

1.1 Leather:

There is a wide variety of uses for Leather for example as a raw material itself or finished product like shoes or clothing. JSMO is following the activities of ISO/TC 120 Leather and ISO/TC 216 Footwear and through this work we expect to be able to keep updated on evolving requirements.

In particular, the most important benefit expected from the work of ISO/TC 120 Leather is the improvement of raw hides and skins including pickled pelts; tanned hides and skins, and finished leather and leather products, and for ISO/TC 216 Footwear, is the improvement of performance requirements for components for footwear.⁶

1.2 Garment:

Textiles are one of the most important and versatile commodities in the global economy. The textile industries involve the provision of raw materials, preparation of fiber production, manufacture of yarns and fibers, manufacture of fabric formation, finishing processing including bleaching, dyeing, printing, coating, special chemical treatments, the transformation of the fabric into clothing, upholstery, or industrial/technical textiles, smart textiles and rope, and netting formation.

As for the Leather sector, we are following the activities of ISO/TC 38 Textiles and the most important benefit expected is the alignment with improved international specifications for textile products.⁷

2. Chemical and Cosmetic Industries

2.1 Cosmetic:

development of Standards for cosmetics for which there is a market need.

As for the previous sectors, we are following the activities of ISO/TC 217 Cosmetics and the most important benefits expected, are facilitating access to the cosmetic global market and improving the quality and safety of the products.⁸

2.2 Chemical:

2.2.1 Fertilizers:

Food production and food security are increasingly a concern as world population continues to increase. Without significant increases in arable land to produce food this concern will continue to gain worldwide attention and concern.

As for the previous sectors, we are following the activities of ISO/TC 134 Fertilizers and Soil Conditioners and beneficial substances (i.e. materials whose addition is intended to ensure or improve the nourishment of cultivated plants and/or to improve the properties of soils, and the efficient use thereof). The most important benefits expected from this work are facilitation of trade, confidence in quality (both nutrient and contaminant related) in fertilizer and soil conditioners is a key aspect contributing to and expanding food availability and the need for food security.⁹

2.2.2 Paints and varnishes:

Important innovation drivers for the industry are changes in legislation in many countries concerning environmental, health and safety and overall efficiency and performance improvement.

⁶ *In its business plan, ISO TC/216.*

⁷ *In its business plan, ISO TC/38.*

⁸ *In its business plan, ISO TC/217.*

⁹ *In its business plan, ISO TC/134.*

As for the previous sectors, we are following the activities of ISO/TC 35 Paints and varnishes and the most important benefits expected are improving the quality and safety of the paints, varnishes and related products, including raw materials.¹⁰

2.2.3 Surface active agents:

Today, many products are traded on the basis of technical specifications, and most products traded require proof of compliance with certain technical specifications and safety regulations before being released onto the global market.

Here we are following the activities of ISO/TC 91 Surface active agents and the most important benefits expected are improving the quality and safety of the products and access the global market, and JSMO are a P-member in this TC.¹¹

3. The Therapeutic Industries and Medical Supplies

In many countries, healthcare is largely publicly funded, which brings natural stress on available resources for healthcare in combination with optimal access for all citizens. Authorities have a national responsibility, which includes establishing requirements that medical devices or their manufacturers must fulfill in order for the devices to be allowed on the market in their jurisdiction.

Here we are following the activities of ISO/TC 210 Quality management and corresponding general aspects for medical devices and the most important benefit expected, is the improvement of requirements and guidance in the field of quality management and corresponding general aspects for medical devices.¹²

4. The Packaging, Paper, Cardboard, Printing and Office Supplies Industry:

4.1 Packaging:

The packaging industry must continuously review the social significance of packaging and develop or improve it to harmonize with society in response to today's trends including environmental conservation, the aging population combined with the diminishing number of children, and the widespread use of technology.

Here we are following the activities of ISO/TC 122 Packaging and the most important benefit expected is to improve the design of packaging fitting for global consumer needs of accessible to address relevant social, safety, health, or environmental concerns.¹³

4.2 Paper, board and pulps:

Paper has many applications in everyday life. Such applications include:

- Paper for Information and Communication, commonly used for advertising, business, and educational purposes [e.g., correspondence, reports, forms, coupons, tickets, books, magazines, flyers, posters, brochures, inserts, and newspapers];
- Packaging papers and boards used as protective carriers for durable goods [e.g., boxes, wrappers, and bags];
- Household and sanitary purposes [e.g., tissue and towels];
- Industrial applications [e.g., building products and laminates]

Here we are following the activities of ISO/TC 6 Paper, board, and pulps and the most important benefit expected is to improve the product and quality specifications, and the establishment and maintenance of appropriate calibration systems.¹⁴

5. Plastic and Rubber Industries:

5.1 Plastic:

Here we are following the activities of ISO/TC 61 Plastic and the most important benefit expected is the timely development and maintenance of quality, market-relevant, material, and semi-finished products for the plastics industry.¹⁵

5.2 Rubber:

¹⁰ *In its business plan, ISO TC/35.*

¹¹ *In its business plan, ISO TC/91.*

¹² *In its business plan, ISO TC/210.*

¹³ *In its business plan, ISO TC/122.*

¹⁴ *In its business plan, ISO TC/6.*

¹⁵ *In its business plan, ISO TC/61.*

The wide variety of rubber and rubber products makes the task of development very challenging and requires careful planning and prioritization of projects while addressing the changing market needs and consumer trends.

Here we are following the activities of ISO/TC 45 Rubber and rubber products and , the most important benefit expected is the improvement of rubber and rubber products.¹⁶

Other selected manufacture sub-sectors¹⁷

These sub-sectors are covered by the JSMO “Mechanical” sector unit, which is also responsible for extractive industries and the transport sector.

Introduction:

The other manufacturing sub-sectors identified as a priority for the NSS are important contributors to the national economy and are listed below.

1.1 Wood products and furniture.

Jordan’s wood and furniture is the third largest industrial sub-sector (in terms of the number of firms, which rely heavily on skilled labor). Jordanian furniture is distinguished by the production of high-quality products leading to exports to eight major markets, most of which are centered in the Gulf region. Most of this sub-sector’s firms are ISO-9000 certified and have acquired other essential quality certificates, in addition to the use of the latest technology and modern equipment to meet the international quality standards. Key export products include wooden panels, foam, veneer, plywood, carpentry, molds, hand tools, and structures, wooden handicrafts, cork products, straw and plaiting, and furniture of all kinds (e.g., for kitchens, home, offices, restaurants, schools, hospitals, and laboratories).

Key economic data regarding this sub-sector are presented in the table below.

year	% of export	Total export	Number of companies	Number of employees
2018	0.16 %	17.1 M JOD	101	3896

1.2 Crafts

Jordan’s crafts include the processing of wooden products as well as the production of jewelry, whereby gold or silver ore are brought for cutting, engraving, and shaping for the production of rings and bracelets, and various forms of jewelry, to be sold to jewelry stores, ateliers, and workshops.

Key economic data regarding this sub-sector are presented in the table below.

year	% of export	Total export	Number of companies	Number of employees
2020	4.83 %	355 M JOD	1250	NA

Although there are no studies mentioning the current number of workers in this sub-sector, according to the Jordanian Vocational Training Corporation in 2019 a total of 11815 people (of which 40% are females) graduated from 19 different sectors including the following:

- Metal forming and general mechanical maintenance.

¹⁶ In its business plan, ISO TC/45.

¹ according to the database Statistic

²Jordan’s Product Space,’ the Jordan Strategy Forum, January 2017, http://jsf.org/sites/default/files/P_S_1_E.pdf

- Carpentry, upholstery and decoration.
- Vehicles and machinery maintenance.

According to the Jordanian Vocational Training Corporation the employment rate of graduates is about (61%) and in some sectors it exceeds 95%.

1.3 Valve, Pressure equipment, and Tanks

Pressure equipment includes gas cylinders, tanks, and containers intended for the storage of pressurized gases and liquids. This sector is vital due to the presence of such products in almost every home and the potential high risk related to their use.

Some 30 million gas cylinders are annually consumed in Jordan, with a daily average of 80,000, varying from 55,000 during summer to 100,000 in winter¹.

Exact number of accidents and injuries related to this sub-sector aren't available, but according to news reports, in 2019, 9 gas cylinder accidents were reported, of which 3 took place in restaurants and during a time period of 60 days. Although 9 accidents might not seem much, it should be considered that these are not accurate and complete figures, and pressure vessel accidents could be devastating due to the extreme pressures and location of these cylinders.

Therefore, standards regarding pressure vessels and valves play a vital role in saving lives. Recently there has been an increase in demand for such standards due to the development of the "Reesha Gas Field" in Jordan.

1.4 Gas appliances.

Almost every home in Jordan has some kind of gas appliance, whether it's an oven, cooker, or heater, in the Household Appliances segment, the number of users is expected to amount to 2.2m users by 2025. In 2019, Jordan imported a total of 25 million JOD worth of gas appliances. Regarding accidents, the civil defense bureau stated that in the winter of 2019 it dealt with 77 accidents related to domestic heaters and gas cylinders which lead to 250 injuries and 24 deaths, this number is on the rise and actions must be taken to save citizen lives.

Key Stakeholder groups

Based on the elements collected from the reference publications, the groups of stakeholders for the "other selected manufacture sub-sectors" are outlined below:

- Public authorities** (Ministry of Trade and Industry & Supply, Ministry of Labor, Ministry of Finance-Jordan Customs).
- Manufacturers, Exporters, and Importers.**
- Mechanical industry factories.**
- Consumers and communities.**
- Associations (GASAT, JEA)**

The target groups listed above have different requirements. Coordination with the competent public authorities is clearly a top priority – aiming to define the specific role of standards (and technical regulations managed by JSMO) in support to the Jordanian regulatory framework for the sector.

Challenges

- Lack of information and statistical studies make it more difficult to do precise RIA studies prior to implementing new Jordanian technical regulations.
- lack of enforcement, follow up and implementation

- High cost and time needed for the adoption and preparation of Jordanian standards.

Contribution Of Standardization:

Standardization is important for the identified priority sectors, particularly in relation to Consumer Protection, Product quality and Trade facilitation.

All the sub-sectors described in this section are supported by standardization activities managed by JSMO since several years – from a strategic perspective what is important is to maintain a continual improvement approach, following industry trends, target markets’ and evolving regulatory requirements, and to respond to them appropriately.

In what follows are outlined the subject areas considered most important from this perspective and some specific, reference standards to be adopted.

1. Wood products and furniture: Extra care should be given to the adoption of international/regional standards and to the development of new Jordanian standards in order to keep up with latest inventions and designs as well as to increase the competitiveness of Jordanian furniture and woods in the global markets. For example, it is important to consider standards for seating (EN 1022:2018), children furniture (EN 1130:2019), and office furniture (EN 527-2:2016+A1:2019, EN 1335-2:2018). Also standards developed by ISO/TC 136 “Furniture” are an essential reference.

2. Crafts: Improving the quality of local products and adapting them to international specifications and increasing their competitiveness. JSMO’s missions include the calibration, adjustment and control of measuring instruments and monitoring the quality of precious metal and gemstone jewelry according to prescribed calibers and inspects and stamp jewelry. Therefore standards regarding weighing scales must be in line with the latest international standards such as standards published by OIML. Also, standards regarding the safety of skilled workers are of great importance, such as OSHA regulations for work environments in general.

3. Valves, Pressure equipment, and Tanks: Adoption of international standards to align Jordan’s producers and service providers with agreed international good practice (consider e.g. standards for flanges, along with standards such as ISO 7-1, ISO 7-2, ISO 228-1 & ISO 228-2 regarding pipe threads). In addition, it is important to revise and update old JSMO’s standards, to meet the higher quality specifications of other countries for products such as industrial valves and automatic shut-off valves.

Another very important topic is LPG cylinders. LPG cylinders are installed in every house and recently new demand has been developing in Jordan due to the increasing usage of gas-powered vehicles. Some Jordanian standards require updating, targeting e.g. ISO 15995:2021, and other standards of the ISO 11119 series & ISO 11439.

4. Gas appliances: Regarding ovens and space heaters whether for domestic or outdoor use, many of the Jordanian standards are adopted from European standards, of which some are withdrawn or modified, therefore Jordanian standards such as JS 30-1-1/2017, JS 10127/2012 & JS 10130/2012 must be revised and updated.

Materials & Extraction of materials

The mining and extraction sectors are considered key strategic industries in Jordan. Jordan is among the world’s top 10 producers of bromine, phosphate rock, and potash. It also produces modest quantities of

calcium carbonate, cement, clay, crude oil, iron and steel, kaolin, limestone, natural gas, pozzolanic materials, refined petroleum products, silica sand, and zeolites, mainly for domestic use. Moreover, Jordan offers an attractive proposition for investors in the extraction and processing of copper, uranium, and oil shale.

Key economic data regarding this sub-sector are presented in the table below

year	% of export	Total export	Number of companies	Number of employees
2019	10.76	1234.7 M JOD	34	8972

Contribution of standardization

Standardization can contribute to this sub-sector by Improving the quality and competitiveness of local products (Potash, Phosphate, and Cement), by adapting them to international specifications. Another very important part of mining concern the mining processes, including aspects such as the Structures of mine shafts, Classification of mine accidents, and Air quality control systems for operator enclosures.

JSMO is following the activities of by ISO/TC 82 Mining and through this work we expect to be able to keep updated on evolving requirements for the sector.

Transport and road safety

Among the various aspects regarding the transport sector, an important priority from the NSS perspective concerns **road safety**. According to the annual traffic accidents report In 2021: 5.3 deaths occur per 100.000 population in Jordan. Among the top ten death causes in Jordan, Road injury is in third place after heart disease and stroke. Daily Jordan loses over 0.88 million JOD due to traffic accidents, with a 1.2% annual increase.

This matter concerns imported products – in 2018, Jordan imported vehicles for a total of 1.6 billion USD, which represents about 8% of total imports – as well as the domestic maintenance and repair services for vehicles. It is very important to take proactive measures to ensure the safety of cars and in particular car parts.

Contribution of standardization

Standardization can help by updating old Jordanian standards and adopting new ones regarding car and motorcycle parts, the quality/performance of which is critical to support vehicle and road safety. The subject areas considered most important are presented below, including references to some specific standards to be adopted or developed.

1. **Tires**; Specification for New tires for Passenger Vehicles. It is of national importance due to accidents that have occurred due to bursting tires. In 2021, tires accounted for the largest percentage of causes of traffic accidents, 33.7% of accidents were caused by tires, followed by tail-lights, mirrors, brake lights, braking system, and steering system in order. Also standards for used or retreaded tires are essential due to the low cost of these tires that leads many consumers to prefer them over new ones. Another important factor effecting the safety of tires is the storage conditions. Energy efficiency is also an important issue and standards for energy labeling of tires are required.

In this area JSMO should consider reference documents such as standards published by ISO/TC 31 Tires, rims and valves and REGULATION (EU) 2020/740, along with possible national developments related to the specificity of local conditions (e.g. high mean temperatures and dry climate).

2. **Seat belts/ Passenger occupation sensor;** Seatbelts are the first line of passive defense for passengers. For example the Jordanian standard for seatbelts 1077/1998 needs to be updated, therefore immediate attention should be given to them. Also no existing Jordanian standards cover passenger and driver occupation sensors. There are many international standards available to choose from such the ones published by ISO/TC 22 and the EEC.
3. **Car seats;** currently there are no Jordanian standards for child safety seats and restraints systems. Child seats are used in Jordan but without reference standards the quality and safety of these seats cannot be assured. Therefore standards such as ISO 29061 series and ISO 13215 series should be taken into consideration for adoption.
4. **Braking system;** Brakes are crucial for the safety of any kind of vehicle and in 2021 braking systems were the cause of 18.1% of traffic accidents. Therefore, brake standards must be up to date and in line with the global market and safety recommendations. Many Jordanian standards regarding the braking system are more than ten years old such as JS 1847 and other standards are not in line with reference global standards. In addition to that, important global standards such as ISO 4926 and ISO 4927 are not adopted as Jordanian standards and this should be done.
5. **Helmets and protective clothing for motorcycles;** Due to the increasing cost of gas and traffic jams in Jordan, many people are transferring to motorcycles. They offer fast transportation as well as low fuel consumption. But without proper protective clothes, especially helmets, they can be of great danger on users. Standards regarding helmets, gloves, shoes, and protective clothes such as ISO 13232 series, EN 13594, and EN 13634 must be adopted and compliance to them required, to prevent bad quality products from entering the Jordan market.

Construction

Introduction

The construction industry is a critical component of any economy. The construction of houses, factories, offices and schools is part of this sector's activities. The sector also includes the building of roads, bridges, ports, airports, railroads, and other things. The construction sector also maintains and repairs existing structures.

The construction sector includes industrial activities (regarding the production or import of Construction Products and Materials) and service activities (engineering, construction projects, building and infrastructure maintenance, etc.).

In what follows the analysis is restricted to the industrial component of the sector (Construction products and materials)¹⁸.

Sub-sectors

This sector includes two main sub-sectors:

- Conventional Construction products and Materials.
- Products and materials for Green buildings

¹⁸ Main references: Studies carried out by the Jordan Chamber of Construction Industry; The Construction & Housing Sector in Jordan- The Challenge of Demand & Supply Alignment & Financing Mechanisms; Green Building Informative Booklet.

In what follows an outline is provided for both sub-sectors – but it is the Green building sub-sector that has been selected as a priority sector in the framework of the NSS.

1. Conventional Construction products and Materials

Construction products and materials include the following:

Construction products:

- Tiles and Tile adhesive.
- Concrete and related products ex. Concrete Pipes.
- Gypsum boards.
- Mortars and grouts.
- Artificial stone and marble.
- Blocks and Bricks.

Construction Materials:

- Cement.
- Aggregate.
- Stone.
- Gypsum.
- Natural lime stone and Marble.
- Building lime.

Key economic data regarding this sub-sector are presented in the table below:

year	% of export	Total export	Number of companies	Number of employees
2019	1.54%	112.9 M JOD	2753	17951

2. Products and materials for Green buildings.

As defined by the World Green Building Council, Green Building is “a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate, health and natural environment.” They are resource efficient, produce less emissions and they save money over the building lifecycle.

Economic data for this sector aren’t currently available because its size is still relatively limited and it has not yet gained a specific characterization. However, it is a very important and rapidly developing component of the construction sector, for the following reasons:

- 1- Energy and water consumption of buildings contribute significantly to the stress on energy and water resources (key priorities addressed in other sections of this document).
- 2- Given the importance and growth of the construction sector, there is a need to reduce construction waste, increase resource efficiency and reduce overall negative impacts of construction works.
- 3- In Jordan there is significant human capacity and high rates of literacy and education which means promising potential on qualified workforce to support green building practices.
- 4- Contribution to reducing high unemployment rates: Green building projects and practices provide significant job opportunities, while at the same time contributing to improving environmental performance.

The construction of buildings that can be qualified as “Green buildings” requires products and materials that comply with specific requirements. Some of them are covered by JSMO standards that define characteristics, properties and test methods for environmentally friendly construction, including:

- Environmental friendly cement.
- Water-saving fixtures and equipment's.
- Blocks, tiles, and concrete boards.

- Plasterboard products.
- Long steel products for construction.
- Paints.
- Products — Floor coverings.
- Paints, coatings, stains and sealers.
- Concrete Ready mixed concrete, pre-cast concrete, concrete products and dry bagged mortars.
- Acoustic and thermal building insulation.

Green building techniques and construction materials, together with sustainable energy technologies, have evolved quickly in recent years and their potential for savings and efficiency must be incorporated into construction and buildings management codes in Jordan.

Activities in this area are supported and promoted by:

- The National Green Building Council (established in 2009) that has published the Jordan Green Building Guide; incentives offered by the Government, such as: Bonus density, Tax exemption, Bonus quota, Streamlining and One stop shop *)
- specific projects, such as an UNDP Project focused on applying the concept of Green buildings by renovating governmental buildings using insulating materials to increase energy efficiency, and a systemic approach to Sustainable Urbanization and Resource Efficiency in Greater Amman Municipality (SURE), which comprises a Package of Public Instruments for De-Risking Energy Efficiency Investment in Buildings (Existing and New) in Jordan.

*) More details regarding these measures can be found here <https://www.amman.jo/ar/gam/green.aspx>

Challenges

- lack of enforcement, follow up and implementation of building codes and, in particular, green building recommendations.
- Referring in some codes to non-Jordanian specifications, despite the availability of Jordanian standards, creating confusion (especially in case of conflicting requirements). In addition, some codes don't refer to the updated versions of standards.
- The difficulty for consumer to distinguish between natural stone and natural marble, with natural stone often sold as marble with unjustified high prices.
- There isn't yet an effective industry of "green" construction products and no efficient use of green construction products standards.
- Lack of awareness about Sustainable and Green buildings.

The contribution of standardization

Standardization and related activities (such as training and communication on existing standards and their implementation) can support the development of the Green building sector, particularly in relation to the following aspects:

- Guidance documents along with training services
- Standards and conformity assessment schemes supporting enforcement by authorities.
- Development of an Eco- labeling scheme and quality mark that, combined with government incentives, could encourage the industry of green construction products in Jordan, providing a sound basis of specifications for green construction products and contrasting the misleading advertising of fake Green products
- Raising awareness about Green buildings and local construction products for Green building, helping to create a good environment for investment.

- Specific mandatory requirements, voluntary standards and related compliance procedures for manufacturing of construction Products and Materials, with particular attention to the following Conventional construction products:

- a. Precast Concrete Pipes: Jordanian Standard JS 289:1994 must be revised to align with latest technology of manufacture and to take care of durability and resistance of concrete pipes to corrosion of inner sides.
- b. Hollow blocks for slabs: Jordanian Standard JS 994:1993 must be revised to align with latest technology of manufacture.
- c. Artificial Stone and Marble: Due to the increasing rate of importing and manufacturing of Artificial Stone and Marble, New Jordanian standards regarding Artificial Stone and Marble must be developed.
- d. Tiles grouts and adhesives: New Jordanian standards regarding Tiles grouts and adhesives must be introduced (adoption of relevant ISO or EN standards should be considered) to align with updated industry technology.

Information and Communication Technologies

Introduction

Science and technology is Jordan's fastest-growing economic sector. This growth is occurring across multiple industries, including information and communications technology (ICTs), solar and wind energy and nuclear technology. Contributing to about 12% of GDP, Jordan's ICT has developed into one of the leading sectors in the region, with more than 600 active companies directly employing about 16,000 employees, and an overall contribution to about 84,000 jobs in the wider economy.

There are thousands of standards addressing various aspects of ICTs at the international and sectorial level (including ISO/IEC JTC 1 and ITU-T standards; SDOs - such as IEEE standards, and a myriad of standards from industry consortia— such as W3C, IETF, OMG, Oasis and hundreds of others).

However, until now, stakeholders have not requested JSMO to address ICTs in a structured and focused way. In the framework of the NSS a specific action is proposed, regarding the engagement of stakeholders and the organizations of in-depth interactions with them. Based on the results, priority areas for standardization in the ICT sector can be selected and the NSS amended accordingly. Environmental Challenges

Introduction

As outlined above, two primary subject areas have been selected under this priority area: Waste Management and GHG emissions.

Both comprise horizontal (cross-sector) and sector-specific aspects. Premised that more work needs to be done in collaboration with the Ministry of Environment and other concerned stakeholders (similarly to what indicated above for ICTs), strategic subject areas already identified concern:

- Waste Management:
 - Solid Waste: the growing amount and complexity of SW generated in Jordan has not been accompanied with adequate sanitation facilities and management programs. Jordan generates 2.2 million tons of solid municipal waste per year¹⁹, growing annually by 5% of which only 7% is recycled or salvaged mainly by the informal sector. All the rest is disposed in its landfills – there

¹⁹ Source: UNDP, https://www.jo.undp.org/content/jordan/en/home/ourwork/our_stories/new-municipal-solid-waste-recovery-and-recycling-contract-improv.html#:~:text=Jordan%20generates%202.2%20million%20tons,mainly%20by%20the%20informal%20sector.

are currently 21 landfills in Jordan: 7 of them have been closed (due to bypassed capacity limit and pollution issues) and only one of them, the Al Ghabawi landfill, meets international best practice (i.e. being sited after a feasibility study, receiving an environmental impact assessment, and meeting international standards for design and construction). Over 50% of the SW produced in Jordan is bio waste, notably food waste by households; 15% is plastics, 14% paper and cardboard and the remaining 20% comprises metals (4%), glass (4%) and various other types of waste. The recycling rate for MSW stands at 7%.

Under SW, two types of waste are currently receiving particular attention:

- **Electronic waste (e-waste)**, which is one of the fastest growing types of waste. Issues related with e-waste are already addressed by regulations and standards under development (regarding electrical/electronic products).
 - **Plastic waste**, another rapidly increasing type of waste. Plastic bags and other plastic materials are a major source of environmental degradation and represent a substantial cost burden for waste management authorities. Uncollected plastic waste is also responsible for reducing the effectiveness of municipal drainage infrastructure. An estimated 3 billion plastic bags are used each year in Jordan, amounting to approximately 500 per person. In 2014, MoEnv introduced regulations on importing and producing plastic bags, with the goal of preserving the environment, the economy, and eliminating the adverse effects of plastics on public health.
- **Green House Gas (GHG) emissions:** assessing, monitoring and reporting data about GHG emissions are fundamental activities concerning all types of sectors, a pre-requisite to support initiatives and programs for Climate Action.

A general description of the current situation and key issues to be addressed is presented below.

Waste

- The waste sector is highly impacted by the challenges in demographics – including the rapid rate of population increase (waves of refugees) and urbanization – that are adding more pressure on the services provided by the government including waste collection, transfer and treatment. SWM is a complex issue that involves a plurality of actors with differentiated responsibilities, notably the Ministry of Municipal Affairs through its executive arms, and the Ministry of Environment. To address the sector’s challenges, the country has pursued improvement in both the legislative and planning dimensions during the last five years. The sector is governed by the Waste Management Framework Law No. 16 of 2020 which sets the roles and responsibilities of all the competent authorities to ensure that appropriate treatment and disposal of waste is mandated, and to achieve the priority of ensuring the environmental and human health. A variety of regulations from the Ministry of Municipalities and the Ministry of Environment completes the legislative framework. The National Solid Waste Management Strategy (2015-2034) and its action plan aims to shift the national solid waste management toward a modern and integrated one using the “Three-Rs” approach (Reduce-Reuse-Recycle) within a span of 20 years. The strategy sets short, mid and long-term targets for the different waste treatment proposed activities including recycling and reduction of the quantities of bio-waste ending up to landfills.
- The amount of waste for electrical and electronic equipment (known as WEEE or e-waste) generated every year in the Jordan is increasing rapidly: it was estimated around 5.4 Kg/capita in 2019 so it is now very important to introduce in Jordan specific regulations and related standards regarding WEEE to bring the matter under control, contrasting its negative impact on health, safety and the environment.

GHG emissions

- According to the overall GHG Inventory estimates, Jordan contributed 31,063.32 Gg of CO₂ eq in 2016. A breakdown of Jordan's total emissions of GHGs by sector indicated that the Energy Sector is the major emitter accounting for around 76% of total national emissions, followed by the Waste Sector with a contribution of around 12%. GHG emissions by sector in 2016 are shown in Table below:²⁰

GHG aggregate emissions in Gg CO₂eq by sector, 2016

Categories	Emissions Gg CO ₂ eq	Percentage of the overall
Total National Emissions and Removals	31,063.32	100%
Energy	23,649.47	76.13%
Industrial Processes and Product Use	3,177.42	10.23%
Agriculture, Forestry, and Other Land Use	428.71	1.38%
Waste	3,807.73	12.26%

- Emissions from the energy sector result primarily from fuel combustion activities, with major contributions from Energy Industries and Transport subsectors with shares of 37% and 38% respectively followed by "Manufacturing Industries and Construction" and "Other sectors" (Residential, Commercial, and Agriculture), each of them accounting for 10%.

Key stakeholders

1. Higher Steering Committee for Solid Waste
2. Jordan Engineers Association (JEA)
3. Jordan Environment Society (JES)
4. Jordanian Green Building Council
5. Ministry of Agriculture (MoAg)
6. Ministry of Interior, Environmental Protection Directorate
7. Municipalities (including GAM)
8. Recycling companies
9. Waste collectors (formal and informal)

Challenges:

- Waste

The current situation that combines high rates of waste generation with limited disposal options results in over 90% of all waste landing up in unmanaged landfills and dumpsites across the country.

Waste leachate is not captured and ends up seeping into the soil, contaminating the groundwater. Uncovered landfills also harbor pests that spread diseases, posing threats to public health and general wellbeing. As the population grows, waste generation is expected to increase by 3% per annum, including MSW and hazardous waste

20

<https://unfccc.int/sites/default/files/resource/Jordan%E2%80%99s%20Second%20Biennial%20Update%20Report%20for%20web%2010-5.pdf>

- Emissions and pollution

Increasing population and low quality transportation are primary drivers of increasing GHG emissions and air pollution.

Access to public transport continues to be a challenge in Jordan, with citizens increasingly dependent on individual passenger vehicles for their transport. This situation contributes to increasing fossil fuel use and ambient air pollution.

The contribution of standardization

An outline of key subject areas where standardization can provide a significant contribution is given below.

- **Solid waste management.** This is an area that is mainly addressed by national (or regional, such as in the case of Europe) **regulations**, that may refer to specific standards. The most important aspects usually addressed concern: a) waste characterization (information about the sources, quantity, inflow, composition of waste provides the foundation for all stages of a successful solid waste management); b) separation, collection and transportation of waste; c) management and treatment of different types of waste; d) re-use/recycling of waste; e) energy recovery; f) landfill management.

There is an ISO committee dedicated to the matter (ISO/TC 292, Waste collection and transportation management) and there are many important references providing **guidance for policies and best practices**, including e.g. the World Bank resources for solid waste management, the EU resources regarding waste and recycling, the International Solid Waste Association (ISWA), the US-EPA Best Practices for Solid Waste Management.

- **E_waste**

Waste from electrical and electronic equipment includes a large range of devices such as computers, fridges and mobile phones at the end of their life. This type of waste contains a complex mixture of materials, some of which are hazardous. These can cause major environmental and health problems if the discarded devices are not managed properly. In addition, modern electronics contain rare and expensive resources, which can be recycled and re-used if the waste is effectively managed.

Standards such as the EN 50574 and EN 50625 series provide specifications on how to collect, transport, sort and treat waste electrical and electronic equipment (WEEE) so that it can be routed to the best end of life option for recovery, recycling or re-use.

- **GHG emissions:**

There are many international standards available dealing with GHG emissions – addressing aspects such as the correct assessment of GHG emissions of processes, organizations and products; as well as reporting and communication of GHG emissions.

Leading international standards are the **GHG Protocol** (a joint WRI and WBCSD initiative), which establishes comprehensive global standardized frameworks to measure and manage greenhouse gas (GHG) emissions; the **ISO 14060 series**, that provides a comprehensive framework for quantifying, monitoring, reporting and validating or verifying GHG emissions and removals; and many more sector-specific or activity-based ones.

In this area it is essential to interact with the competent government agencies and key stakeholder groups to identify priority areas (e.g. energy, transportation, residential buildings, industry...) and select the most appropriate standards to be adopted and used, along with related implementation initiatives.

- **Pollution/Emissions:**

- Standards addressing quality of fuel used for vehicles, resulting in decreased exhaust emission.
- More strict standards regarding minimum exhaust emissions of vehicles such as EURO 6 standards for diesel and petrol vehicles.

Activities covering other sectors

Responding to diversified stakeholder needs

Priority areas to be addressed by standardization have been presented in the previous sections: they have been selected considering national priorities stated in government's strategic plans and programs (see list at page 4) and analyzing if and how standardization and related QI activities can contribute to them.

The National Standardization Strategy is focused on these priority areas and the corresponding mid-term and annual strategy implementation plans will include a significant number of standards projects addressing them. They mainly comprise adoptions of relevant international and regional standards, complemented by original national developments in a few areas important for Jordan, for which particular conditions or needs of the country require adaptation of international deliverables or ad hoc developments.

However, standardization activities undertaken by JSMO are not limited to such priority areas.

As National Standards Body (NSB) of Jordan, JSMO has the responsibility of engaging a broad variety of stakeholders in the standardization processes and of supporting standards development activities responding to their specific needs.

Given that human and financial resources of NSBs are limited, it is important to allocate them in a balanced way: on the one hand, this requires to reserve a significant amount of resources in support of national priorities (as indicated in the NSS) but, on the other hand, to maintain an adequate reserve of resources to respond to diversified stakeholder needs.

Standardization activities covering sectors beyond priority areas may include:

- standards projects, already initiated or to be initiated, but included in the existing standards work program
- new items indicated by stakeholders through the conventional process of requirements' collection
- new items related to unplanned events or urgent needs of particular stakeholder groups.

The development of a strategy implementation plan and of JSMO's annual standards work program will be undertaken taking into account all the elements outlined above.

Horizontal themes

The primary objective of the National Standardization Strategy (see Chapter “Objectives and Approach”) is the selection of priority areas for standardization aligned with national priorities, regarding economic sectors, infrastructures, health and safety and environmental issues.

However, the NSS also gives the opportunity to highlight key “horizontal themes” regarding standardization activities in the country: i.e. strategic directions for strengthening and improving standardization in Jordan, with a view to optimize its contribution to economic and social development.

JSMO has identified five strategic directions – described below – and is actively working on the set-up of specific programs and projects to implement them.

Facilitating doing business in Jordan

This is a very important matter, underlined in all the government’s strategic plans (of general scope) considered as reference sources for the NSS.

The key issue, from the perspective of the organizations that constitute Jordan’s National Quality Infrastructure (NQI), is that of contributing to simplifying and streamlining regulatory requirements and companies’ obligations – without compromising the safeguard of health and safety of citizens and protection of the environment.

Satisfactory developments in this area require a strong collaboration among Ministries and regulatory authorities responsible for the various sectors and functions (such as market surveillance), JSMO and stakeholders from the private sector.

An important line of development promoted by the Government (as recommended by the PM guidelines, 2020) concerns the adoption of Good Regulatory Practice (GRP) and the implementation of Regulatory Impact Assessments (RIA) for the introduction of new, or the revision of important regulations.

JSMO is currently experimenting the RIA approach and is considering the possibility of re-thinking the regulatory framework in different sectors. Various solutions are under evaluation, including, for example, the possibility of introducing just a single (or a few) main regulation(s) setting essential, mandatory requirements covering a given broad field, complemented by standards (voluntary) providing detailed specifications and other provisions (e.g. test methods) to be applied for demonstrating compliance with essential requirements set in the regulation.

These possible developments require a clear understanding of the difference between Technical Regulations (mandatory) and Standards (Voluntary) by all the concerned parties, a gradual modification of the system to assess compliance and to ensure the correct functioning of the market, practice with the implementation of RIAs and GRP by all the concerned parties.

Promoting and supporting the participation of stakeholders in standards development
Stakeholders are the most important element of the standardization system: standards are indeed created by them and for them and it is essential to ensure a broad, inclusive and effective engagement and participation of stakeholder in standardization processes and particularly in standards development.

A key responsibility for the National Standardization Body is to reach out to different communities and to communicate clearly the importance and benefits that standards bring to the country and to the organizations that use them, along with the benefits for the organizations that participate in standards development.

Another fundamental duty for the NSB is to facilitate participation, making easier to join technical committees and working groups and to work within them, providing appropriate tools (see following points) and assistance by means of dedicated, competent professionals (technical officers) able to interact, listen to the needs and guide experts through the procedural and substantive matters affecting standards' work projects.

JSMO is committed to develop a specific plan for stakeholder engagement (comprising various aspects and new services) and is very interested in receiving input and feed-back from all stakeholder groups.

Optimize participation in international standards development and collaboration with other standards organization

Participation in international standards development needs to be reconsidered in view of the national priorities set in the NSS – taking into account that different forms of participation require different levels of effort and resources, and provide different benefits.

It is important, first of all, to recall that the vast majority of JSMO standards are national adoptions of international standards from ISO and IEC, and of a few more organizations (such as CEN, CENELEC, ASTM, etc.).

Taking ISO and IEC as the basic reference, in most cases participation with observer status (aka O-membership) in technical committees and sub-committees is sufficient: that gives access to all documents produced by the committee and does not prevent the possibility of providing comments, if needed. The resources invested for O-membership are limited and require essentially the availability of a few experts – supported by a JSMO technical officer – for monitoring the progress of work and reviewing the documents deemed most interesting from JSMO's perspective.

Engagement as “participating member” (or P-membership) is very different. In that case the NSB takes the commitment of participating actively to the committee meetings and development efforts and to vote on the documents submitted for balloting at the various stages of the development process. This type of participation is more demanding: it requires national experts to be fully involved in the development process and to participate in committee meetings (which, in case of meeting in presence, also entails travel and accommodation costs, other than time for traveling).

On the other hand, full participation offers several (potential) advantages, among which it is useful to underline:

- deeper understanding of the matter under development and of many related or lateral issues
- possibility of establishing professional and personal contacts with experts from other organizations and countries, allowing to set-up a network of contacts that could be very useful for various purposes (e.g. collaborations, exchange of experiences/knowledge transfer, etc.)
- possibility of influencing the development of future standards, ensuring that, as a minimum, through the development process Jordan's needs and specific interests are explicitly expressed and taken into account (which does not mean that they are necessarily incorporated in the standard, but that through the consensus-process they should be carefully considered).

It is therefore clear that participation as P-member should be carefully considered and selected for a relatively small number of committees, directly linked to national priorities, or strongly supported by particular stakeholders, for which the advantages are expected to outweigh costs.

Similar considerations apply to agreements – and more importantly to their implementation – with other national and regional standards bodies.

Based on the above, JSMO can re-launch the “calls for experts” for participating in international standardization activities, providing clear and specific motivations.

Technological and organizational improvements

This is an area very seriously pursued by many NSBs, that has experienced a significant acceleration after the emergency caused by the pandemics in 2020.

Using information technology solutions in support of the standards development process, complemented by organizational improvements aimed to take full advantage of such technologies, can deliver substantial advantages to JSMO and its stakeholders.

Taking as a reference the systems implemented by ISO and IEC, it is possible to outline some of the most important IT-based services provided to the community of standards developers:

- access to standards project data and documents through internet-based applications
- electronic workspaces for technical structures (committees, sub-committees, working groups, ad hoc, advisory and special groups) supporting technical work
- notification and tools to support the online execution of key standards development process tasks (e.g. submission of documents; electronic balloting applied to the various stages, including management of comments; notification services)
- management of data regarding experts and related roles in technical structures
- management of meetings (physical and virtual, with specific web-conferencing tools and on-line meeting guidelines for the latter).

The applications developed by ISO and IEC are to a significant extent available to their members and, in several cases, ad hoc services are directly provided by the central secretariats to NSBs.

Information technology solutions are also used for the dissemination of standards – in particular, e-commerce services allowing selecting, purchasing and downloading standards in pdf and other formats; along with more advanced services such as subscription to collection of standards, with possible additional features.

JSMO is actively working in all these areas and plans to roll-out IT-based solutions during the timeframe covered by the NSS.

Support the implementation of standards

JSMO is well aware of the importance of services to support the understanding and the implementation of standards.

In this respect, a first priority concerns the improvement and strengthening of training services.

Starting with priority areas and through focused consultation with stakeholders, JSMO plans to develop a catalogue of courses tailored to address standards’ user needs.

Additional initiatives (e.g. set-up of discussion groups/virtual forums addressing specific sectors; or development of consulting services) may follow, based on the essential input to be provided by stakeholders.

Draft implementation plan

As indicated under item 5 of the Methodology section, a draft implementation plan for the NSS is under development and it will be finalized after the stakeholder consultation.

The implementation plan will cover a three-year timeframe, listing the standards projects (work items) to be initiated, processed and completed each year and indicating the approach followed for each work item (i.e. adoption from international, regional or other standards organization, participation in international/regional standards development, national development).

The standards project listed in the implementation plan will comprise work items directly related to the priority areas highlighted in the NSS, along with work items that are indirectly related to the priority areas and work items meeting other stakeholders' requests. An evaluation of the resources required to support the development of standards projects over the concerned 3-year timeframe will complete the process, leading to a total number of work items that could be realistically included in the implementation plan.

A starting point is the standards' analysis table (Annex A), that provides information on the current JSMO's portfolio of published standards and of standards projects already included in the work program for 2022 and 2023 – i.e. work items for which JSMO has a commitment regarding their processing and publication. The table also includes a first estimate of the incidence of work items related to the NSS priority areas.

The implementation plan will take into account this data, along with proposals of new items to be agreed with all concerned stakeholders, considering that precedence should be given to those belonging to priority areas.

Some considerations can already be made with reference to Annex A:

- two priority areas are covered by a rather small number of work items (standards under development), notably **Water** and **Environmental challenges** include **Halal cosmetics**. For these areas a focused interaction with the concerned stakeholders is imperative, aiming to identify the most important work items needed, enriching the JSMO's standards portfolio
- additional analysis is required for assessing the standards needs in other two priority areas, **Energy** and **Food** (a significant number of standards projects target these areas, but more information is needed to ensure that they include those most important/needed)
- the **Manufacturing sub-sectors** and **Construction** listed among the priority areas are covered by a significant number of work items – in these cases, as indicated in the corresponding sections of the NSS, it is mostly an issue of continual improvement, through consultations with concerned stakeholders
- some potential priority areas (notably **ICTs** and **Transportation**) require a planned consultation with concerned stakeholders to define specific standardization objectives for the sector.

Specific actions – centered on stakeholder engagement – should be undertaken in parallel to the launch of the NSS.

Stakeholder request 2022

Entity	Topic
Jordan Customs	chewing tobacco
	mineral oils
	Refined and raw vegetable oils
	Precious and semi-precious stones
	cardboard
	Lupine beans prepared as animal feed
	milk with animal fat Replaced by vegetable fat
	glass crystal
Border control	Extruded aluminum and aluminum alloy bars, tubes and profiles Part 1: Technical conditions for inspection and delivery (revise JSs)
	Aluminum Alloys for Windows and Door Assembly - Characteristics
	Household utensils - aluminum cookware
	Iron and steel products - black tin and tinsplate by electrode position and cold formed
	Aluminum - Cold Rolled Aluminum Foil (7-20) μm Thickness – Dimensions (revise JS)
	Artificial marble
	artificial stone
	cement boards
	Sandwich panels: load bearing Non load bearing
	Lighting lamps and luminaires
	SMART watches
	Soap that contains natural large pieces
	electronic cigarettes
	Face masks
	ATF oils with new properties suitable for special developments in the automotive industry, especially hybrids such as plug-in
	Granite pots
	Aluminum foil food containers (revise JS)
	Cold rolled aluminum foil (revise JS)
	metal cleaning wire
	The fiber intended for cleaning and made of a sponge layer(revise JS)
	Personal protective equipment - safety shoes (revise JS)
	Aluminum (revise JS)
	The lobe (revise JS)
	automatic transmission fluid (revise JS)
	Brick oil (revise JS)
	Brush used adhesives (revise JS)
	Spray Adhesives (revise JS)
	Carpets and rugs
	spray paint (revise JS)
	Aluminum cooking pots(revise JS)

	double-edged cipher (revise JS)
	flat glass (revise JS)
	Feminine pads modified PH (revise JS)
	Plastic and rubber gaskets
Laboratory Unit	Soap containing synthetic detergent
	Dishwashing detergent tablets - dishwasher tablets
	Laundry Detergent Tablets - Washing Machine Tablets
	Stain and grease remover
	oven cleaner
	clothes freshener
	Laundry Bleach - Tablets
Ministry of energy	Energy management series (ISO 5001, 5004...etc.)
	Central air conditioning
	car batteries
	Batteries used in renewable energy projects
Laboratory unit	performance and energy efficiency for LED lamps and LED lighting units of various types
	New EE technical labeling and ecodesign