



**The Importance of a
Country's Welding Industry,
Its National Welding
Capability (NWC) and
Their Significance to the
UN Sustainable Development
Goals (SDGs)**



Short Report

Edited by *Chris Smallbone*

The Importance of a Country's Welding Industry, Its National Welding Capability (NWC) and Their Significance to the UN Sustainable Development Goals (SDGs)

<https://iiwelding.org/iiw-jointothefuture/iiw-and-sustainable-development/>

Short Report

Long Report Volume 1: NWC and SDGs Interconnected and Interdependent in the Welding Industry

Long Report Volume 2: Potential National Welding Capability Welding Industry Projects and Resources

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Foreword



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The International Institute of Welding (IIW) was founded in 1948 by the Welding institutes or societies of 13 countries that considered it crucial to make more rapid scientific and technical progress in welding possible on a global basis [1]. Its membership today comprises welding organisations from 51 countries worldwide.

IIW provides a unique cooperative and collaborative platform for experts, practitioners and policy makers in the welding and related industries to share not only technical information and innovation, but knowhow in all areas affecting a country's ability to achieve sustainable development in a sustainable environment and fulfil their responsibilities in a cooperative and converging global community.

As the world population continues to grow, the pressures on manufacturing, infrastructure and power generation, not to mention basic needs such as food, water, shelter and education, have become enormous common challenges. The welding industry is a significant global industry and, together with welding as an enabling technology, it plays a critical role in the world's ability to cope with these pressures and changes and drive significant progress.

The IIW community is dedicated to the concept of helping all countries build their own sustainable welding capabilities to meet these challenges and improve the quality of life for their people and all mankind. The IIW Project "Establishing a National Welding Capability (NWC) in a Country" is a means of achieving this [4].

This report, which is split into a Short Report and two volumes of a Long Report, is an outcome of the IIW National Welding Capability (NWC) Project. It provides guidance, including practical ideas and recommendations, on how a country's welding industry can improve its national welding capability and simultaneously progress targeted UN Sustainable Development Goals (SDGs) as well as complement other initiatives being taken by governments, aid agencies, industry and like-minded organisations.

It is hoped that the guidance, ideas and recommendations in the report will lead to enhanced cooperation and collaboration between countries, governments, industries, aid agencies and organisations in mutually beneficial projects to enhance the NWCs and SDGs.

Besides improving the quality of life for so many, the rewards for involvement by individuals and companies will be immense.

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*“With the four attributes of **ENTHUSIASM, PERSISTENCE, COOPERATION & COLLABORATION** we can all work together in an excellent team effort to improve the quality of life globally.”*

Chris Smallbone, IIW President 2005-2008, IIW Fellow



Short Report

Executive Summary

This report highlights the crucial role that a country's national welding capability (NWC) can play through its welding industry in progressing the 17 UN Sustainable Development Goals (SDGs) and 2030 Agenda in the country.

It will serve as a reference point and catalyst for governments and organisations in industry, research and development, education and training, qualification and certification, technology transfer as well as standards-making and regulatory bodies to cooperate and collaborate in progressing both the NWC and SDGs in a country.

The 51 member country International Institute of Welding (IIW) and present regional organisations have potential roles in addressing the existing specific regional disparities through establishing global partnerships and enthusiastic collaboration to progress the SDGs.

The period set by the UN to achieve the targets for the SDGs by 2030 has now passed 50% with the global targets currently achieved falling well short for many reasons.

This report gives a number of specific recommendations on how the welding industry in a country, and globally, can improve on this particularly by prioritising the strategies and projects to be implemented particularly in relation to the resources available in the country so that the resources and efforts are devoted to do the most good.

In this regard, examples of possible welding industry projects for each SDG are shown in Section 1 of Volume 2 of the Long Report which will result in mutually beneficial outcomes being realised for all parties in improving the National Welding Capability, progressing the Sustainable Development Goals and improving the quality of life for all.

Note: All numbered references in the text are listed in Section 2 of Volume 2 of the Long Report.



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IIW Vision, Mission and Core Values

Vision

The leading global welding community linking industry, research and education

Mission

Advance welding and joining through a worldwide network

Core Values

IIW is committed to the advancement of welding and joining for a safer and sustainable world

IIW operates based on mutual respect for diversity, culture and languages



1. Introduction to the International Institute of Welding (IIW)

The International Institute of Welding (IIW) was formed in 1948 [1]. After the devastation created through the Second World War, Europe in particular, was in a terrible mess but countries got together in 1947 and formed ISO and IIW amongst other organisations to somehow build up the quality of life again. 13 countries formed IIW (11 European, USA and South Africa). This number has grown to 51, illustrating the importance countries give to welding and the role of IIW and its members in improving the quality of life globally.

As an outcome of a meeting with UNIDO in 1994 in Vienna, the International Institute of Welding (IIW) through its IIW Board of Directors Working Group Regional Activities and Liaison with Developing Countries (WG-RA), introduced the unique IIW WeldCare Programme to assist developing countries improve their national welding capabilities, particularly through the establishment and/or growth of a not-for-profit national welding organisation. Some of the successes of this programme including how it could be used for future challenges identified by the UN and many IIW members were shown in 2007 [2].

Since 1994, IIW WG-RA has assisted many countries freely through the holding of IIW technology innovation workshops, governance workshops, national welding capability workshops and International Congresses as well as providing them with information, expertise and documentation on successful activities particularly from experiences in many countries and globally [238]. The Chapter entitled “*Emerging Nations*” in the IIW history book “*linking people, joining nations*” shows many of these activities including the IIW Project “To improve the global quality of life by the optimum use of welding technology” [3].

2. IIW National Welding Capability (NWC) Project

In 2013, as an extension and expansion of the IIW Weld-Care Programme through IIW WG-RA, a project “Establishing a National Welding Capability (NWC) in a Country” was created to work with the welding industry in a country.

The welding industry is taken as those organisations and people:

- involved with the total life cycle of welded products/structures including design, manufacture, fabrication, construction, conformity assessment, inspection and testing, operation, maintenance, repair and decommissioning including recycling, repurposing and other environmental conditions
- engaged in, or employing, any of the organisations or people involved above;
- supplying welding equipment or consumables or materials to be welded; and /or
- involved with education, training, qualification, certification, research and development, work health and safety (WHS), standards and industrial relations aspects of welding.

The original concept of the IIW NWC Project was to assist developing countries to create an optimal NWC in their countries and hence improve the quality of life in the country by achieving the following objectives:

- to identify the welding related needs in the country and provide solutions to ensure the country's future sustainability in relation to these needs;
- to implement its own National Welding Capability (NWC) Project as a Flagship Programme;
- to identify the country's existing capability and consolidate the existing welding related ‘building blocks’ in the country to create the basis for an NWC;
- to analyse, and identify the improvements required in the existing welding related ‘building blocks’ as well as what additional ‘building blocks’ are required in the country; and
- to create the mechanisms and processes, to establish and maintain the country's sustainable NWC including the possible establishment or improvement of a national organisation(s) responsible for leading the promotion of welding and related disciplines.

Such a national organisation must be able to:

- (i) be correctly established in terms of a country's legal, ethical, financial and other compliance requirements with correct governance and management systems in place;
- (ii) cooperate and collaborate with the relevant organisations in the country to ensure that the NWC is achieved and sustained;
- (iii) have adequate highly credible human resources to succeed in the agreed plans;
- (iv) be open for as many of the other organisations and people in the industry to have membership and have ownership of the NWC where applicable;
- (v) enable companies and people to access technologies and technical information to meet their needs;
- (vi) respond to demonstrated needs of companies and have relevant support for solutions within the organisations in the NWC;
- (vii) develop strong links with industry and other agencies particularly in the NWC;
- (viii) provide ready access to facilities and services in the NWC;
- (ix) not unnecessarily duplicate facilities and services already existing in the country and be capable to proactively highlight how to readily access such facilities and services to any enquirer;
- (x) seek to collaborate with national and international organisations/agencies to meet the needs of industry, the country and SDGs;
- (xi) provide the Forums/Boards/Committees etc. necessary to have all relevant organisations collaborating in the various NWC 'Building Blocks' and SDGs.

Several very successful NWC workshops have been held since 2013 to assist not only developing countries but also developed countries which could utilise them to improve their national welding capabilities. These have included Romania, Bulgaria, Serbia, Greece, South Africa, India, New Zealand, and Thailand amongst others [4].

Based on feedback from the workshops and International Congresses held, the need for comprehensive guidance notes with links to a knowledge resource centre were identified and are being prepared. Further feedback has also indicated that some countries may need some direct assistance in implementing improvements to their national welding capabilities. This could involve creating a list of people prepared to assist countries as Mentors.

3. UN Sustainable Development Goals (SDGs)

The United Nations (UN), has 193 countries as members and with the challenges of improving the quality of life in countries, the UN has implemented the 2030 Agenda for Sustainable Development with its 17 Sustainable Development Goals (SDGs) aimed particularly at low and middle income countries. The SDGs are a collection of 17 inter-linked objectives designed to serve as a shared blueprint for peace and prosperity for people and the planet, now and into the future. They emphasise the interconnected environmental, social and economic aspects of sustainable development by putting sustainability at their centre. The full Sustainable Development Report 2023 giving the Global SDG Index and country reports is on Sustainable Development Report 2023 (sdgindex.org) [5].

Sustainable Development meets the needs of the present without compromising the ability of future generations to meet their own needs.

The title of each UN SDG and a small amount of detail on the SDG have been used in the Long Report, and together with the number of targets and indicators for each UN SDG, more detailed information on each UN SDG can be found at. https://en.wikipedia.org/wiki/Sustainable_Development_Goals [6].

There are well documented criticisms and challenges regarding the targets for the UN SDGs not being achieved by 2030. Although some of these may be true, it does not prevent countries attempting to progress the SDGs and give benefits to their populations which might not have arisen without having the focussed SDG approach in place.

The volume of information, factors and activities related to the welding industry which can have a positive effect upon the SDGs is immense but only a few examples are shown under each SDG in Section 4 Volume 1 of the Long Report.

The welding industry in each country will also need to prioritise the strategies and projects it implements so that its resources and efforts are devoted to do the most good and beneficial outcomes will be realised. Hence, the recommendation of using an Industry Sectoral Project (ISP) approach wherever possible.

4. Linking the National Welding Capability and UN Sustainable Development Goals

To link the NWC and the SDG could involve strategies being introduced by a country including implementing a Flagship Programme with a single global focus “To Assist the Country to Establish, Sustain and Improve Its National Welding Capability and Progress its UN Sustainable Development Goals”. Such a Programme may have many initiatives and projects associated with it but all are related to the single global focus.

Improving a country's national welding capability can make a significant contribution to, and have a very positive effect on, many national and international programmes including the SDGs which also build on various existing national and international agreements.

There is an identified lack of national welding capability planning globally. Much information has been compiled however to identify the key components required in order to develop such a plan and provide guidance on what it ought to consider. A particular focus on a potential response against each UN SDG can also be provided through this approach and could be adapted for country-specific context.

The welding industry representatives in countries such as Brazil [137], Ghana [130], India [28], New Zealand [104], Nigeria [131], Romania [135] and South Africa [19] have already published reports on how improving their national welding capabilities will positively affect the UN SDGs in their countries.

When one considers the networks which the IIW, its 51 Member countries, universities, colleges, research organisations and companies involved in welding have, bringing all the available welding resources plus other capabilities required for development together to assist in achieving SDGs, can have a remarkably positive effect globally on all countries.

5. UNESCO Report on Engineering and the UN Sustainable Development Goals

On 4 March, 2021, UNESCO published a report titled “Engineering for Sustainable Development: Delivering on the Sustainable Development Goals” [7].

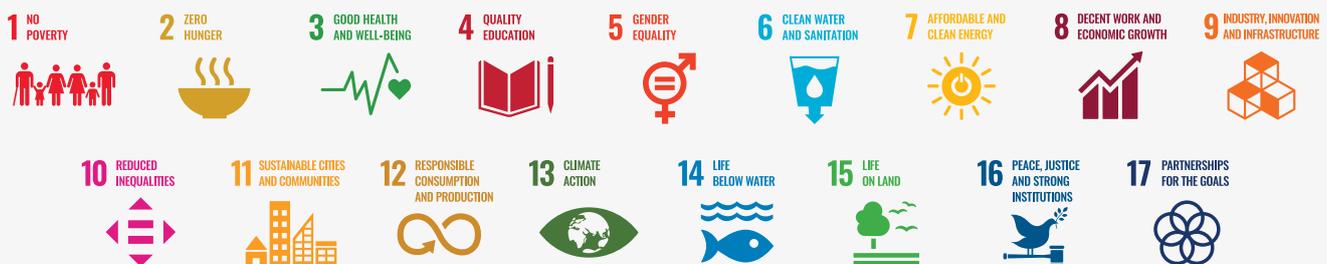
The IIW subsequently established an IIW Task Group to compile an IIW report on how the global welding industry could assist in improving a country's national welding capability including progressing the country's UN SDGs as well as complement the UNESCO report and other initiatives and projects which might be taking place in a country or globally.

This IIW report therefore serves as a catalyst for countries to implement actions to improve their national welding capabilities and, simultaneously, positively progress their UN SDGs. Furthermore, the initiative will stimulate cooperation and collaboration both within and between countries at governmental, organisational and individual levels to prioritise and target SDGs in conjunction with their welding industries particularly related to the resources available.

Global trends, as referred to in the UNESCO report, have not been repeated in the IIW report, and, where necessary, can be referred to directly [7]. These might include information on poverty and inequalities, demography, environmental degradation and climate change, shocks and crises as well as the development and financing of resources and projects related to the SDGs.

Recommendations and possible future actions have been presented in the Long Report for consideration by countries.

SUSTAINABLE DEVELOPMENT GOALS



6. Possible Approaches to Move Forward

There are four possible approaches amongst others, for the global welding industry to move forward in helping as many countries as possible to improve their national welding capabilities and progress the SDGs:

- each country's welding industry could work on its own in deciding what actions it will take if it so wishes. The welding industry could appoint its own Lead Organisation to implement a Flagship Programme in its country;
- a global cooperative and collaborative approach between as many nations as possible with an organisation such as IIW as the catalyst and lead to promote such an IIW Flagship Programme and each IIW Member also having its own country's Flagship Programme;
- welding industries in regional groups such as the European Welding Federation (EWF), Asian Welding Federation (AWF) and South East European Network (SEEN-ET) could lead and promote the Flagship Programme in their regions;
- individual countries simply assist another country by mutual agreement. There are many examples over the past three decades of how IIW member countries have previously cooperated and collaborated with developing countries.

In practice, it is likely that a range of approaches may be taken depending on the situation in each of the 193 UN member countries. For example, many countries do not have a Lead Organisation such as a national welding organisation to lead such a Flagship Programme. Regional groups may not have the resources to introduce a regional Flagship Programme unless they are given or raise sufficient resources to do so. In some regions such as Oceania,

the Middle East or Latin America and the Caribbean, formal groups could be established with the support of organisations such as the UN or International Atomic Energy Agency (IAEA) amongst others since examples of successful initiatives involving the IAEA with respect to nuclear health and safety exist globally. Such examples could be replicated in the welding field.

The establishment and sustainment of the resources to maintain an optimal NWC and SDG Flagship Programme in a country and hence progress the NWC and SDGs is probably the biggest challenge to be faced. In terms of the types of resources, sufficient people with the right dedication and drive will be the major challenge. In the first instance, key people representing key organisations need to agree to be part of the Flagship Programme and bring with them the appropriate team players with the relevant skills to implement and succeed with the various plans.

Having both industry and government "champions" will become essential to help overcome the constraints which will be faced along the way, in particular, the financial challenges which will arise. Agreement will also need to be reached on how the Flagship Programme Lead Organisation will be chosen either from an existing organisation, restructuring an existing organisation or establishing a new organisation. Whichever one is chosen, the goodwill of all participants needs to be harnessed with all people pulling in the same direction from the beginning. If one can receive sufficient support for the acceptance of the existing national not-for-profit welding organisation to be the Lead Organisation or establish such an organisation, then the structures in such an organisation should enable the Flagship Programme organisations to work together to achieve successful outcomes.



Photo supplied by SAIW shows delegates from IAEA and 12 African countries at SAIW in Johannesburg for the launch of the 2022 Nuclear Energy Management Schools programme (NEMS2022)

7. Welding Industry Key SDG Initiatives

Key areas identified in a country to assist in achieving the SDGs in conjunction with the welding industry include, amongst others, establishing or improving:

- the national welding capability
- the support infrastructure provided by the welding industry
- research and development
- technology transfer
- national and international networks
- education, training, skills and careers
- qualification and certification of both individuals and companies
- appropriate cultures
- communications and marketing
- resourcing the strategies and actions required

8. Some Previous Examples of Cooperation and Collaboration

There are many examples over the past three decades of how IIW member countries have previously cooperated and collaborated with developing countries to assist in improving their national welding capabilities. Such examples include amongst others: Germany has assisted China, Vietnam, Ethiopia, South Korea and Indonesia; France has assisted Thailand, Morocco and Kazakhstan; UK has assisted Malaysia; USA has assisted Trinidad and Tobago; Japan has assisted Vietnam and Egypt; Austria has assisted Indonesia; South Africa has assisted Africa (IAEA); South Africa has assisted Nigeria; Holland and Canada have assisted South Africa; Portugal has assisted Brazil, Angola and Mexico; Spain has assisted Peru and Mexico. The main emphasis in all of the examples mentioned was on education and training and transfer of appropriate technologies.

Appendices 3.4, 3.5 and 3.6 in Volume 2 of the Long Report show many examples of other collaborative initiatives by IIW Members during the past three decades. Since 2003, 22 successful workshops covering topics such as promoting the concepts of technology innovation, governance and a national welding capability have been held in various countries by IIW Members and reported on at IIW WG-RA meetings each year. Since 2011, seven IIW Welding Research and Collaboration Colloquia (WRCC) provided a unique opportunity for international researchers from universities, industries and governments to meet, present, and discuss the research and development work they are conducting, or planning to do, alone or in cooperation with other researchers. Since 1988 over 40 IIW International Congresses have been held across the world in various regions promoting cooperation and collaboration between countries. Many of these activities are shown in the IIW book by Barnett, D., "Linking People, Joining Nations. The Impact of the International Institute Welding (IIW) since 1990", Published by IIW 2017 <http://iiwelding.org> [3].



9. Potential Future Actions, Strategies and Projects

Ideas for possible strategies and projects have been included in Volume 2 of the Long Report for each SDG. These ideas have also been compiled in a list with potential resources in Section 1, Volume 2 of the Long Report. Tables of potential projects which could be conducted by a country's welding industry to both build up the country's national welding capability but also improve appropriate UN SDGs are shown.

Under each SDG, it shows potential **Welding Industry Roles** which could be fulfilled by the welding industry in a country. In the table under each SDG **Welding Industry Role**, each potential project has an item number linked to the number of the SDG. For example, SDG 1/1 is simply SDG number 1 potential project 1. The projects are not in any particular order of priority. In the extreme right hand column, possible sources of obtaining ideas and resources for that project both practical and financial from somewhere in the world are shown.

Government or industry programmes which would be useful for a project are also shown. Mentioning past programmes is also useful since they could be used for ideas and programmes in other countries. In the right hand column, the reference numbers shown are those in the Reference Section 2 of Volume 2 of the Long Report.

10. Regional Approaches

Regional groups and individual organisations have been identified as potential welding industry players in projects in Section 5 of Volume 1 of the Long Report.

Some examples are given involving both formally established organisations and informal organisations in various regions which are cooperating and collaborating in this regard, and other regions of the world where such regional organisations probably need establishing to optimise the effects on the SDGs.

The designated regions do not follow any UN structure but are simply chosen based on the knowledge of countries previously or presently cooperating or collaborating in the welding field. These include African, South Asian, South East European, Asian, European, Latin American and Caribbean, North American and Middle Eastern regions.

11. Industry Sectoral Project (ISP) Approaches

In some SDGs, an Industry Sectoral Project (ISP) approach has been recommended since this approach harnesses all relevant groups from industry, government departments, research and academia, education and training at all levels, amongst others, giving optimal ownership, effectiveness, efficiencies and results. Obviously, factors outside the control of the welding industry such as pandemics and global financial crises can have major negative effects on the best laid plans.

It is essential that one must:

- prioritise the strategies and projects to be implemented so that the resources and efforts are devoted to do the most good and beneficial outcomes will be realised in improving the NWC and progressing the SDGs.
- use the initiative to stimulate cooperation and collaboration both within and between countries at governmental, organisational and individual levels to prioritise and target SDGs in conjunction with their welding industries.
- use a targeted, prioritised industry sectoral project approach both for the NWC and for a number of SDGs, not a “scattergun” approach
- continually show the value of, and return on, the efforts by all parties for the country
- work nationally and internationally directly with:
 - ▶ Leading firms;
 - ▶ Small and Medium Enterprises (SMEs);
 - ▶ Supply Chains;
 - ▶ Education, Training, Qualification and Certification Organisations;
 - ▶ Research and Development (R&D) Organisations;
 - ▶ Technology Specialists in an NWC/SDG Support Centres (SCs) Network;
 - ▶ Government departments, regulators and standards bodies.

The first stage of an ISP is to analyse and define the key challenges, opportunities and requirements that will gov-

ern the competitiveness of the country's capability in each industry sector and identify specific areas where welding, joining and fabrication innovation and technology needs to be upgraded and transferred to improve both companies and the country's competitive advantage and market performance in that sector including the effects on progressing the SDGs [16].

The second stage is to select ISP activities to meet the identified needs, demonstrate the innovation and technologies to be implemented and identify how the solutions can be implemented, document the activities of the demonstrations and outcomes, disseminate the ISP activities to the wider industry and plan activities for future actions needed, including research, development, education, training, qualification, certification and standards development which will also continually progress the SDGs.

The third stage will involve capturing all the appropriate information in transfer mechanisms such as key Expert Technology Tools (ETTs), Technical Guidance Notes (TGNs) and Standards for each technology/sector application/SDG and facilitate the ongoing transfer, uptake, tailored application and skills development by industry in each of the welding/joining/fabrication technologies/practices and SDGs identified through the ISP.

Some of the welding industry sectors identified in the SDGs include food, rail, road transport, water, pressure equipment, building & construction, energy, pipelines, marine platforms, pharmaceutical and medical devices. ISPs have been successfully implemented in countries such as the UK, Australia, Germany, Canada and USA and outcomes could possibly be transferred into interested countries throughout the world.

12. Potential Support for Resources

To deliver on building up the national welding capability and progressing the SDGs will require clear leadership on many fronts, appropriate financing, clear implementation plans with targets and indicators, excellent communication and, in particular, a willingness for numerous parties to cooperate, collaborate and accept accountability in many areas.

For each country involved, it is important that a framework is established within the country which enables all relevant parties to be included.

The scale of the industries and people affected by welding and needing to be involved in the NWC Project and SDGs means that it often needs one national organisation to play a leading role in managing the cooperation and collaboration required amongst a team of organisations to drive the progress to an optimal national welding capability and 2030 Agenda.

Such an organisation may or may not already exist in a country but once established it must be a well-regarded organisation so that it can build up the trust and confidence to obtain the support of all other parties interested in being involved in the fulfilment of the NWC and SDGs

Normally such a national organisation driving the common good plan would need to be a not-for-profit body assisted with some government and industry funding particularly since many of the activities which will need implementing will not be income generating. This will become clearer when one considers these different activities in a business plan. Its scope in terms of roles, responsibilities and activities will be determined as the relevant organisations to be involved in the national organisation meet, strategize and establish or modify the organisation to meet the NWC and SDG objectives.

In the NWC Business Plan there will be strategies to assist a country without a national organisation, to establish such an organisation to lead the NWC and SDG Flagship Programme. An NWC Business Plan is essential:

- to continually clarify the thoughts and intentions of all NWC Project participants as a roadmap in the efforts to create a successful NWC.
- to assist a non-NWC person to understand why the NWC Project exists, what is expected from it, how it will achieve its expectations and the potential role for such a person in the NWC Project.
- Such people could include, amongst others:
 - ▶ Government and Aid Agency representatives;
 - ▶ a new NWC Project staff member;
 - ▶ any person interested in any aspect of the NWC Project work;

- ▶ A new, or potential, participant in the NWC Project;
- ▶ A new, or potential, member organisation.
- to improve the image of both the welding industry and the NWC by showing people that the NWC is a progressive, modern, pro-active, enthusiastic project worthy of support and involvement.
- to determine required NWC Project resources including staff, facilities, NWC Project membership, funding, mentoring amongst others.
- to continually show the value of, and return on, the efforts by all parties for the country.

Experience also shows however that in many countries, although such an organisation does exist already, it is struggling to survive and it might be wise for its representatives to also study and implement strategies including strategies on restructuring or even establishing a new national organisation which may help them to reassess themselves and improve their efficiency, effectiveness and sustainability.

In economics, market failure is a situation in which the allocation of goods and services by a free market is not efficient, often leading to a net social welfare loss. Hence intervention to rectify the situation through funding support is necessary. In dealing with governments and industry, one must make sure that you can show the market failure, the identified and verified needs of the country and/or industry, the proposed solutions to rectify the market failure, support from industry and other appropriate organisations and an acceptable return on the government and industry financial support.

With regard to which organisations should be involved in the boards, committees, working groups of the Flagship Programme, examples can be shown that by involving employer associations, government agencies, trade unions, industry training boards, university groups, government research organisations, larger companies and Multinational Enterprises (MNEs) amongst others, these have the necessary power and influence to assist in positively moving the NWC Project building blocks in the right direction.

Examples of how some organisations have succeeded in building up a Lead Organisation are given in the Long Report and it is recommended that by studying these and others in more depth, the necessary resources could be obtained from their experiences as well as others throughout the world. Appendix 3.8 in Volume 2 of the Long Report lists some examples of aid/donor agencies which could also be interested in participating in such a Flagship Programme.

13. References and Links

References have been included in each section of the Long Report, in particular, for each SDG in Section 4 of Volume 1 and potential projects in Section 1 of Volume 2. References have been provided to give examples of past experiences, best practice, sources of information, guidance documents etc, for consideration and possible use by the reader. A consolidated list of these references has been included in Section 2 of Volume 2 of the Long Report so that the knowledge and experiences of others can be harnessed where required.

Where possible, a reference has been linked to its source or to an IIW NWC Resource Centre for access by the reader.

14. Specific Recommendations

According to the United Nations latest report at the midpoint of the 2030 Agenda, Sustainable Development Report 2023, all of the Sustainable Development Goals (SDGs) are seriously off track (sdgindex.org) [5]. “From 2015 to 2019, the world made some progress on the SDGs, although this was already vastly insufficient to achieve the goals. Since the outbreak of the pandemic in 2020 and other simultaneous crises, SDG progress has stalled globally. In most high-income countries (HICs), automatic stabilizers, emergency expenditure and recovery plans mitigated the impacts of these multiple crises on socioeconomic outcomes. Only limited progress is being made on the environmental and biodiversity goals, including SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life on Land), even in countries that are largely to blame for the climate and biodiversity crises. The disruptions caused by these multiple crises have aggravated fiscal-space issues in low-income countries (LICs) and in lower-middle income countries (LMICs), leading to a reversal in progress on several goals and indicators. Despite this alarming development, the United Nations believes that the SDGs are still achievable. None of their objectives are beyond our reach. The world is off track, but that is all the more reason to double down on the SDGs.”

While IIW is playing its role in supporting the welding and manufacturing sectors in achieving the SDGs on a global level, efforts should be taken at different levels. The global welding industry and the national welding industry in each country can still play transformative and influential roles in achieving the optimum NWCs and SDGs in a country, and be a model for other industry and technological sectors to follow.

As part of this report, the following specific recommendations were developed:

1. A country's welding industry should publically support its Government's work on the UN Sustainable Development Goals including working with Government and other agencies to increase the capability and capacity of the country to achieve the SDGs.
2. The welding industry in each country should agree on a Lead Organisation to establish a Flagship Programme with a single global focus “To Assist the Country to Establish, Sustain and Improve Its National Welding Capability and Progress its UN Sustainable Development Goals”.
3. All organisations in the Flagship Programme should integrate the SDGs into their own policy-making and accountability providing a blueprint for national cooperation and collaboration.

4. A national campaign should be implemented to promote the Flagship Programme and obtain the support and involvement of purchasers, specifiers, owners, end users, project managers, design, fabrication, construction, manufacturing, repair and maintenance companies and their related industry associations; compliance, NDT and inspection companies and their related associations; welding equipment and supply companies; material producing and distribution companies; trade unions, research and academic organisations, government departments, regulators and standards making bodies.
5. The welding industry in each country should promote the concept of each organisation in industry, government and academia integrating the improvement of their welding capabilities and SDGs into their policy making and accountability and committing to achieve the SDGs within the scope of their operations and resources.
6. Where appropriate, use an Industry Sectoral Project (ISP) approach to improve the National Welding Capability (NWC) and SDGs. Industry sectors utilising welding which help improve the SDGs include amongst others: agriculture, food, water, mining, rail, roads, bridges, residential and commercial buildings, steel construction, pipelines, medical equipment and devices, pharmaceutical, rolling stock, automotive, aircraft, shipbuilding, trucks/buses, pressure equipment, oil and gas, mineral processing, petrochemical, power generation, coal fired, nuclear, gas turbine, hydro, solar, wind, renewables and aerospace.
7. Prioritise the strategies and projects to be implemented, particularly in relation to the resources available in the country, so that the resources and efforts are devoted to do the most good and realise beneficial outcomes in improving the NWC and progressing the SDGs. Examples of possible welding industry projects for each SDG are shown in Section 1 of Volume 2 of the Long Report.
8. The Lead Organisation, together with industry, governments and aid agencies, analyses and supports worthwhile projects and initiatives in building up the NWC in a country or region to progress the SDGs.
9. A system be established within the Lead Organisations and welding industries in the various countries in a region to share ideas and methods on conducting strategic planning exercises, needs analyses, regular auditing, reviewing and reporting progress, success stories and lessons learnt, even from failures on initiatives and SDG projects.
10. Where appropriate, countries in a region, or a regional group which may already exist, can be encouraged to cooperate and collaborate on projects and activities as indicated in Section 5 of Volume 1 of the Long Report.

Enthusiasm

"You can do anything if you have ENTHUSIASM.

"ENTHUSIASM is the yeast that makes your hopes rise to the stars. Enthusiasm is the sparkle in your eyes, the swing in your gait, the grip of your hand, the irresistible surge of will and energy to execute your ideas. Enthusiasts are fighters. They have fortitude. They have staying qualities.

"ENTHUSIASM is at the bottom of all progress. With it there is accomplishment. Without it there are only alibis."

Henry Ford

Persistence

"Nothing in the world can take the place of persistence. Talent will not; nothing is more common than unsuccessful men of talent. Genius will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent.

"The slogan 'press on' has solved and always will solve, the problems of the human race."

Calvin Coolidge, 30th President of USA





IIW Vision, Mission and Core Values

Vision

The leading global welding community linking industry, research and education

Mission

Advance welding and joining through a worldwide network

Core Values

IIW is committed to the advancement of welding and joining for a safer and sustainable world

IIW operates based on mutual respect for diversity, culture and languages



Joining to the future

