Global Battery Alliance

Overview, January 2019

GLOBAL BATTERY ALLIANCE

BATTERIES POWERING SUSTAINABLE DEVELOPMENT

Overview

Context

Batteries are a core technology enabling the transformative shift to decarbonize energy and transport systems. However, without deliberate intervention, the potential of batteries to support sustainable development and climate change mitigation is undermined by its own value chain.

- By 2050, batteries will power an electric vehicle market worth $2 trillion. Meanwhile, global cumulative energy storage deployments may grow more than thirty-fold
- However, the battery value chain has been linked to adverse social and environmental impacts, a high carbon footprint, un-tapped potential to reuse and recycle batteries and electrify transport and energy in low- and middle-income countries
- Many organizations are working to address these challenges – but efforts could benefit from greater coordination and scale

The Global Battery Alliance today

The Global Battery Alliance is a global collaboration platform and public-private partnership hosted by the World Economic Forum in Geneva, Switzerland. It seeks to catalyse, connect and scale-up efforts to ensure that the battery value chain is socially responsible, environmentally and economically sustainable and innovative.

The alliance has three strategic objectives:

- Building stable and transparent raw material supply chains characterized by good working conditions and shared prosperity
- Developing the circular and low-carbon value chain that is required to unlock the capacity of batteries to contribute to the realization of the 2015 Paris climate agreement
- Supporting the innovative use of batteries to bring electricity and productivity enhancements to one billion people in low- and middle-income countries

The next stage: outlook for 2019

In 2019 the Alliance seeks to move from building and catalysing partnerships to implementation and delivery.

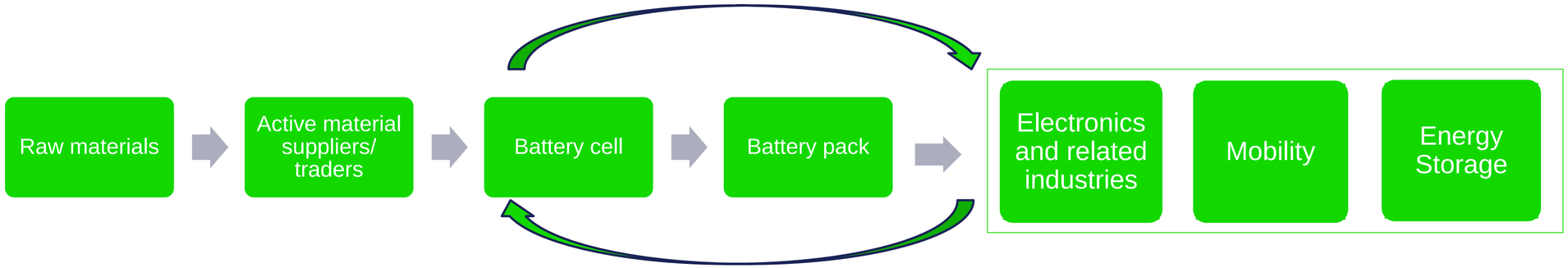
In 2018, the Alliance:

- Resourced a global secretariat at the World Economic Forum
- Developed working groups and triggered commitments to projects and partnerships in Latin America, Central Africa and Europe

In 2019, the Alliance seeks to take action and deliver measurable results across the Alliance's areas of work in raw materials, circular economy and innovation

Key objectives

A public-private partnership seeking to ensure that batteries power sustainable development and climate change mitigation



Overarching Objectives

- Quantifying total impact and potential of the battery value chain
- Mobilizing the full value chain to take action

Deep Dive Objectives & Working Groups

Raw materials for batteries
Building stable and transparent raw material supply chains characterized by good working conditions and shared prosperity

Circular economy for batteries
Developing the circular and low-carbon value chain that is required to unlock the capacity of batteries to contribute to the realization of the 2015 Paris climate agreement

Innovation along the value chain
Supporting the innovative use of batteries to bring electricity and productivity enhancements to one billion people in low- and middle-income countries

The Global Battery Alliance leadership

Supervisory Council
(Principal level)

Co-Chairs	• Martin Brudermüller, Chairman of the Board of Executive Directors and Chief Technology Officer, BASF, Germany • Benedikt Sobotka, Chief Executive Officer, Eurasian Resources Group, Luxembourg • A public sector Co-Chair is being invited
Members	• Marc Grynberg, Chief Executive Officer, Umicore • Gary Haugen, Chief Executive Officer, International Justice Mission (IJM) • Ghislain Lescuyer, Chief Executive Officer, Saft • George Oliver, Chief Executive Officer, Johnson Controls • Michael Posner, Professor, Center for Business and Human Rights, Stern School of Business, NYU • Mark Viso, President and Chief Executive Officer, Pact • Dominic Waughray, Managing Director, Centre for Global Public Goods, Member of the Managing Board, World Economic Forum • Jeremy Weir, Chief Executive Officer, Trafigura Group, Singapore
Additional members	Additional members are being invited to ensure appropriate stakeholder representation along several dimensions (industries, public and private sectors, regions, etc.)

Executive Board
(Senior Executive level)

Co-Chairs	• Guy Ethier, Senior Vice President Supply Chain Sustainability, Umicore • Riccardo Puliti, Senior Director, Energy and Extractives, World Bank Group
Members	• Jennifer Blanke, Vice-President, Agriculture, Human and Social Development, African Development Bank • Gillian Davidson, Advisor to the CEO, Eurasian Resources Group Sàrl • Michihiro Ezawa, General Manager, ESS Division; Chairman, NEC Energy Solutions; NEC Corporation • Richard Fuller, President, Pure Earth • Karen Hayes, Vice President, Mines to Market, Pact • Adam Muellerweiss, Executive Director - Sustainability, Industry and Government Affairs, Johnson Controls • James Nicholson, Head of Corporate Responsibility, Trafigura Group • Jean-Baptiste Pernot, Vice President Operations, Saft • Anna Pienaar, Vice President, Global Partnerships, International Justice Mission (IJM) • Thorsten Pinkepank, Director, Sustainability Relations, BASF SE • Angelo Rigillo, Head of Innovation Governance, Intelligence and Partnerships, Enel SpA • Josef Schön, Strategic Corporate Development and Sustainability, AUDI AG • Arno Tomowski, Head of Corporate Ventures, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH • Jens Wiese, Head, Group Battery Strategy; Head, Industrial Cooperation and Partnerships, Volkswagen AG

40 members

Private

- Amara Raja Group
- Audi
- BASF
- China Chamber of Commerce of Metals Minerals & Chemicals Importers and Exporters (CCCMC)
- Enel
- Eurasian Resources Group
- Everledger
- Fairphone
- Johnson Controls
- Mitsubishi Corporation
- NEC Corporation
- Responsible Battery Coalition
- Responsible Business Alliance
- RCS Global
- Royal DSM
- Saft
- Signify
- Stanley Black & Decker Inc.
- Trafigura Group
- Umicore
- Volkswagen
- White & Case

Public

- African Development Bank Group
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
- International Energy Agency
- Organisation for Economic Co-Operation and Development (OECD)
- United Nations Children's Fund (UNICEF)
- UN Environment (UNEP)
- Washington State (Office of the Governor)
- World Bank Group

Civil society & Academia

- Good Shepherd International Foundation
- International Justice Mission (IJM)
- Pact
- Pure Earth
- Resolve
- Transport & Environment
- Corporate Responsibility Initiative, Harvard Kennedy School of Government, Harvard University (Jane Nelson)
- Center for Business and Human Rights, Stern School of Business, New York University (Michael Posner)
- Department of Information Technology and Electrical Engineering, ETH Zurich, Switzerland (Vanessa Wood)

How to participate in the Alliance

	Who	What	Time commitment
Supervisory Council (invitation only)	**CEO Level** – Global CEOs and Chairmen – Heads of international organizations, ministries or government agencies – Heads of civil society orgs.	– Sets strategic objectives for the alliance – Approves mandate, budget and strategic plan prepared by Secretariat with input from the Executive Board	– Attendance of one 90-minute meeting per year, held at the Sustainable Development Impact Summit in New York (every September)
Executive Board (invitation only)	**VP Level / Head of Department** (e.g. Chief Sustainability Officer, Head of Innovation, Supply Chain)	– Oversees the Alliance across all projects – Sets targets, approves objectives, strategic plan and budget for Supervisory Council review – Decides membership and partnership questions	– Monthly virtual Meetings (approx. 60-minutes each) – At least one meeting per year
Working Groups (“Partners” or Invited members)	**Relevant subject matter expert** (including Steering Board members)	– Developing and implementing project work	– Virtual meetings every two weeks or as deemed necessary by the groups and their project managers
Community Member (all, by default)	**Relevant subject matter experts** from all members of the Alliance	– Giving input to working groups – Learning from Alliance initiatives and members – Being part of the Alliance network	– Access to information and regular communications – Calls with other members on best practices and/or other topics – One annual gathering at the Global Battery Alliance General Assembly

Governance Overview

- Setting **strategic direction**
- Ensuring senior-level support and ownership for Alliance work
- Support with senior-level **outreach**

Supervisory Council

Co-Chairs

- BASF
- ERG
- Public sector Co-Chair invited

Secretariat

- World Economic Forum

- **Decision-making** body of the Alliance
- Approves actions and decisions put forward by working groups and the Secretariat

Executive Board

- Supply of raw materials
- Circular economy
- Unlocking innovation

- Public & private **co-chairs**:
  - Guide working groups, review documentation
  - Moderate calls/meetings
  - Present progress to the Steering Board
- **Project Managers** conduct research, set up calls/meetings, prepare documentation

Working Groups

Cobalt

Lithium

Li-Ion Circular Economy Working Group

Used Lead-Acid Battery Recycling Working Group

Sustainable design for batteries

Unlocking the battery potential

- **Universe of members**
- Consultation calls/meetings
- Annual General Assembly

Community members

Global Battery Alliance Roadmap

GLOBAL BATTERY ALLIANCE
BATTERIES POWERING SUSTAINABLE DEVELOPMENT

Concept phase

Commitments for Alliance formation in place, main objectives defined

Build phase

Alliance resourced, roadmaps developed, delivery infrastructure established with commitments for regional and national partnerships

Action phase

Scale-up of Alliance membership, roll-out and delivery of roadmaps

2017

Sept. — **Sustainable Development Impact Summit 2017,** Sept. 2017, New York, USA

Nov. — **Global Battery Alliance Working Group Meeting,** November 2017, Geneva, Switzerland

2018

Jan. — **World Economic Forum Annual Meeting 2018**, Jan., Davos-Klosters, Switzerland

April — **Global Battery Alliance workshops,** April, Tokyo (Japan) and Paris, France

May — **OECD Donor Meeting,** Paris, France

Sep — **Sustainable Development Impact Summit 2017** September 2017, New York, USA

Oct. — **Global Battery Alliance workshop,** Kolwezi (DRC)

Nov. — **Consultations at ECLAC-BMZ meeting on lithium,** Lima (Peru); **Global Battery Alliance General Assembly,** November 2018, Geneva, Switzerland

2019

Jan. — **World Economic Forum Annual Meeting 2019**, Jan., Davos-Klosters, Switzerland

2018 Highlights

- **Commitments** were catalysed to mobilize and coordinate an investment programme seeking to root out child labour in the cobalt supply chain in the Democratic Republic of the Congo. This will cover efforts by the US Department of Labor, the International Labour Organization (ILO), Pact, with additional multilateral lending under exploration by the African Development Bank (AfDB)
- A **commitment** by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC/CEPAL) has been made to support the Global Battery Alliance in its efforts for a sustainable and innovative value chain for lithium
- A **baseline study** of the end-of-life battery market has been developed for the Global Battery Alliance by Circular Energy Storage to inform the alliance's circular economy strategy
- A **partnership** with the **European Battery Alliance** has been established where the Global Battery Alliance will contribute to the revision of the EU Battery Directive and the EU eco-design principles for batteries in Q1-Q3 2019
- **Partnerships** were formed with the **World Bank** as part of its $1 billion commitment for battery storage to boost renewable energy globally, and with the **International Energy Agency** to co-develop programmes for a sustainable scale-up of electric vehicle deployment in low- and middle-income countries

10 highlights from the General Assembly (28-29 Nov. 2018)

- A “**material passport**” will be developed, containing information about battery health, history and chemistry. Over time this could ensure transparency along the entire value chain and the full battery lifecycle
- A draft **framework for key performance indicators (KPI)** for sustainable batteries will be developed, including considerations of criteria such as sourcing, carbon footprint and design for recycling
- The International Energy Agency joins the Global Battery Alliance to partner on the next phase of the **Electric Vehicles Initiative**
- Analysis prepared for the Alliance is presented, outlining the **circular opportunity** linked to lithium-ion batteries – and opportunities to scale up second life battery use and recycling
- **Partnership catalyzed** between members to develop a concept and mobilize stakeholders **to deploy batteries at scale for electricity provision and productivity enhancements** in low and middle income communities
- A **pilot initiative** between BASF, GIZ, BMW and other partners is **launched** to develop responsibly sourced cobalt in DRC
- A **responsible sourcing field manual** is to be produced, documenting learnings from pilot initiatives and paving the way to a standard
- A **partnership** between members is **announced to tackle child labour** and other challenges in the cobalt supply chain
- **Fundraising and funding facility** to be launched as part of the Global Battery Alliance
- Best practices in **lead-acid battery lifecycle management** to be documented and applied to a pilot in India in 2019

Working Group objectives

GLOBAL BATTERY ALLIANCE

BATTERIES POWERING SUSTAINABLE DEVELOPMENT

Tentative Action Roadmap

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	Q1 Jan. – Mar. 2019	Q2 April – June 2019	Q3 July – Sep. 2019	Q4 Oct.- Dec. 2019
Insights - publications	**Lead-acid batteries management best practices** White Paper	**Artisanal small-scale mining expectations** document/ Field guide **Sustainable design for batteries** White Paper – Design KPIs **Deep Sea** Mining Policy Brief – *GBA + Mining + Ocean teams*	**Total impact and potential of the battery value chain** Report and framework (tbc) **Developing an enabling policy environment for EV battery recycling** White Paper	**Developing a material passport for batteries** White Paper; prototype tbc
Collaboration & convening	**Supervisory Council** Meeting, **Annual Meeting 2019, Davos** 23rd January **Large-scale mining** assurance framework and roadmap	**Supervisory Council** Meeting, Virtual Meeting , June (TBC)	**World Economic Forum on Africa** 3-6 Sep 2019, Cape Town, Africa **Sustainable Development Impact Summit** 23-24 Sep. 2019 New York, USA **UNSG Climate Summit** UN General Assembly, NY	**Global Battery Alliance General Assembly** Oct/Nov 2019, TBC
Action		Action Initiatives in Latin America and Africa *	**Public launch of the GBA pledge and call to action for a sustainable value chain**	

* **Tentative** – upon community decision in Q1

Raw materials – Cobalt Working Group

GLOBAL BATTERY ALLIANCE
BATTERIES POWERING SUSTAINABLE DEVELOPMENT

Theme:
Raw Materials

Long term ambition:
Coalition being formed to take action for a responsible, sustainable and stable cobalt supply from the Democratic Republic of the Congo

Why this project:
DRC is the main cobalt mining producer, accounting for approximately 64% of global production. Around 20% of that production is through artisanal mining. Many challenges surround the cobalt sector in DRC: human rights risks; working conditions; child labour; lack of transparency and contribution to sustainable development in the DRC.

Objectives
Trigger and initiate significant regional public-private partnerships:
- **Towards cobalt for development**: Help ensure that cobalt benefits the provision of core public goods, including a lasting and strong reduction of child labour in the cobalt supply chain; the provision of alternative livelihoods; a measurable improvement in living standards for affected households and individuals (to be quantified)
- **Towards formalisation and control of artisanal mining:** Support the formalisation and control of artisanal small-scale mining through the documentation of effective pilots and the establishment of commonly accepted assessment frameworks
- **Towards insight and data coordination:** Facilitate collaboration and close important data and knowledge gaps

Targeted outcomes in 2019
- Public-private initiatives have been triggered by the Alliance to tackle child labour and improve conditions towards responsible artisanal small-scale mining
- Formal platform for coordination of ongoing projects is established for GBA members
- A framework is published to define what constitutes responsible artisanal small-scale mining in practice
- A mapping exercise is completed with information regarding funding requirements to initiate and scale-up action initiatives
- Relevant large-scale mining assurance frameworks are mapped, endorsed where appropriate and action roadmaps developed by the Alliance

Core partners

Raw materials – Lithium Working Group

Theme:
Raw Materials

Long term ambition:
To develop a responsible, sustainable and stable lithium value chain in Latin America

Why this project:

A threefold rise of the demand for lithium is predicted between 2017 and 2025, which comes with significant opportunities for sustainable development in lithium-producing countries in Latin America if social and environmental challenges can be addressed

Objectives:
Establish a regional public-private partnership platform to support the development of:

- A sustainable lithium value chain, based on impact assessments
- A science and technology network for battery applications in the region
- Roadmaps for storage and renewable integration in the region

Targeted outcomes in 2019
- A regional public-private partnership is formed with strong government support, international and regional private and civil society stakeholders
- A roadmap for action defined and baseline assessments are carried out as required
- Resourcing is mobilized

Core partners (working group under development)

Circular economy for batteries – Li-ion

Theme:
Circular Economy for Batteries

Long term ambition:
Collaborating on advancing a circular economy for batteries

Why this project:

- Standards and partnerships are lacking to lower transaction costs of lithium ion battery reuse in so-called “second life” batteries
- Barriers to large-scale lithium-ion battery recycling is held back through missing needs to be enabled through

Objectives

- Identify, analyse and present macro-data on the economic opportunity of a circular economy for batteries, the carbon emissions footprint of the value chain and projections over time
- Identify applications for second use applications of lithium-ion batteries and establish an action plan to address barriers or enablers for scale-up. An initial focus is placed on standardisation to reduce repurposing costs and investigate liability challenges
- Address barriers to large-scale recycling of EV batteries. An initial focus is placed on opportunities to lower logistics and transport costs.
- Scope opportunities to raise the recycling rate of end-of-life portable devices

Targeted outcomes in 2018-2019

- Baseline research completed to document the opportunity linked to a circular economy for batteries and required interventions to build the needed market conditions
- Concept note to be produced for a digital "material passport" which contains information such as battery health (use, damage) and chemistry. Scope of the passport is to enable expansion to include, over time, material sourcing data and thus information obtained along the entire value chain and the full battery lifecycle
- Develop a white paper to develop objective criteria for a common application of rules to treat second life batteries, initial focus on Europe
- Facilitate a process for a multistakeholder working group to provide input into regulation for sustainable battery management in the European Union (Battery Directive; Eco-Design Principles

Core partners

Circular economy for batteries – lead acid battery recycling

Theme:
Circular Economy for Batteries

Long term ambition:
Lowering adverse health, environmental and economic impacts from informal lead-acid battery recycling

Why this project:

Exposure to lead and unregulated lead acid battery recycling practices contributes to the 9 million premature deaths that are globally linked to pollution each year. In India, each child on average may lose up to 3-6 IQ points from exposure to lead.

Overalll objective:

- Quantify the global impacts of informal lead-acid battery recycling – and the opportunity to address this challenge
- Document public-private interventions to formalise lead-acid battery recycling based on on-going work of Working Group members in India
- Document best practices of lead-acid battery recycling and support a broader adoption of these in low and middle-income countries

Targeted outcomes in 2019 (under development by the Working Group)

- Develop a best practices document on lead acid battery management and the opportunity to apply this in low and middle income countries. A pilot is to focus on India for implementation and improvement of the regulatory framework.
- Documentation of changes affected in India

Core Partners (additional public, private and civil society organizations in discussions to join)

AMARA RAJA Gotta be a better way

PURE EARTH BLACKSMITH INSTITUTE

Additional stakeholders involved

ila International Lead Association

ILZDA

Innovation: design principles for sustainable batteries

Theme:
Unlocking Innovation

Long term ambition:
Support the introduction of sustainable development objectives and principles into product design

Why this project:

- A common understanding is not yet established as to what constitutes a sustainable battery
- Heterogeneous product design makes it more costly to reuse and recycle batteries at the end of life
- At the same time, heterogeneity in design is a natural feature of competitive markets: can design principles be established to strike a middle ground?

Objectives:

- Draft key performance indicators (KPI) or design principles for sustainable batteries
- Facilitate a consultation to refine these KPI and support broad-based adoption

Targeted outcomes in 2019

- Produce a draft framework on key performance indicators (KPI) for sustainable batteries
- Identify relevant stakeholders to participate in this consultative process to refine the KPI and ensure broad-based adoption

Consultations on-going with members, including:

responsible battery coalition

enel

NPL

Audi
Vorsprung durch Technik

Topics under exploration

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Establishing a GBA Financial Services Unit

Theme:
Unlocking Innovation

Long term ambition:
Mobilize, broker and steer to productive uses the billions of dollars that it takes to realize the Global Battery Alliance goals

Why this project:
Significant capital is required to realise the goals set by the Global Battery Alliance. The vast majority of this capital will not be raised or managed by the alliance, but will instead be deployed by various organizations independently. GBA members have identified a need to ensure that these funds are aligned and deployed efficiently and effectively. The GBA thus seeks to lend its platform towards the mapping and steering of these funds to the realization of the GBA's goals

Overall objectives:
- Raise additional funds for the core alliance programme where required
- Become a broker of capital deployment: map the universe of committed funds internationally and how they might be directed to their most productive uses in line with the alliance's objectives
- Fund sustainable business models: mobilize funding to support the realignment of business models along the value chain towards sustainable outcomes

Targeted outcomes in 2019
- Raise additional funds for the core alliance programme
- Map the universe of committed funds internationally and how they might be directed to their most productive uses in line with the alliance's objectives
- Establish processes by which existing funding commitments can be aligned towards the alliance's goals

Core partners
This initiative is under development.

Innovation: Unlocking the battery potential
support the use of batteries for power and transport in low- and middle-income countries

GLOBAL BATTERY ALLIANCE
BATTERIES POWERING SUSTAINABLE DEVELOPMENT

Theme:
Unlocking innovation

Long term ambition:
Support the innovative use of batteries to bring electricity and productivity enhancements to one billion people in low- and middle-income countries

Why this project:
Greater efforts are needed to ensure that energy storage technologies can support sustainable development in low and middle income countries. One billion people remain in need of clean and affordable electricity.

Overall objectives:
- Identify opportunities to use battery technology for support sustainable development in low and middle income countries
- Evaluate current efforts and how the Global Battery Alliance can lend its platform to support these in a targeted manner

Targeted outcomes in 2019
- Identification of opportunities to support significant international efforts
- Develop a concept for how an ecosystem can be created to leverage the potential of batteries to electrify low and middle income communities through energy storage, electric transport and other applications

Consultations on-going with members, including:

iea International Energy Agency

WORLD BANK GROUP

NEC

Tentative calendar

Consultations: toward a sustainable lithium value chain
19 November 2018, Lima, Peru

PDAC Sustainability Forum: Responsible Supply Chains March 2nd 2019
Toronto, Canada

OECD Forum on Responsible Mineral Supply Chains
April 23-25 2019, Paris, France

The Cobalt Conference,
15-16 May 2019, Hong Kong

Sustainable electrification of transport
Workshop, China (tbc)

2019 Oxford EV Summit
June 26-27 2019
Oxford, U.K.

2019

Nov | Dec | Jan | Feb | Mar | April | May | June | July | Aug | Sep | Oct | Nov

Global Battery Alliance General Assembly,
28-29 November 2018, Geneva, Switzerland

World Economic Forum Annual Meeting 2019
22-25 January 2019, Davos-Klosters, Switzerland

UN Environment Assembly
March 11-15 2019
Nairobi,Kenya (TBC)

Establishing a lithium action partnership
Spring 2019
Santiago de Chile, Chile (TBC)

Forum Annual Meeting of the New Champions
TBC
China

World Economic Forum on Africa 3-6 Sep 2019, Cape Town, Africa

Sustainable Development Impact Summit
23-24 Sep. 2019
New York, USA

Global | GBA workshops | Regional World Economic Forum events

Thank you.

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