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**Decision support: Development and deployment of the United Nations Framework Classification for Resources:
Accelerated adoption of the United Nations Framework Classification for Resources: Accelerating decision
support: Breaking adoption barriers**

Informed Dialogue and Decisions for Sustainable Development – Adoption of the United Nations Framework Classification for Resources

**Prepared by the United Nations Framework Classification for
Resources Adoption Group of the Expert Group on Resource
Management***

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Contents

Page

Acknowledgements	3
Executive Summary	7
I. Introduction	9
II. The purpose of UNFC: information for decision support	11
III. UNFC Facilitating an Informed Dialogue for Sustainable Resource Management.....	13
IV. Key learnings from the themes.....	13
A. Resource Governance	13
B. Business management.....	15
C. Capital allocation	15
D. Cooperation and integrated dynamic capabilities	15
E. Digital enablement.....	16
V. Common barriers and recommended measures.....	17
Barriers to accelerated adoption.....	17
VI. Recommendations	17
VII. Proposed Implementation of the Recommendations	19
VIII. Conclusions	28
Annex I Report from the themes	29
A. Resource Governance	29
B. Business Management	31
C. Capital Allocation	33
D. Cooperation & Integrated Dynamic Capabilities.....	37
E. Digital Enablement	39
Annex II List of Recommended Initial Metrics.....	42
Annex III Accounting and decision testing.....	42
Annex IV United Nations Framework Classification for Resources Survey	44
References	49
Figures	
Figure I United Nations Framework Classification for Resources applications	11
Figure II United Nations Framework Classification for Resources in two-dimensional form.....	12
Figure III Simplified matrix designed to show the changes in classification and in project metrics.....	43
Tables	
Table 1 Primary responsibilities.....	21
Table 2 Proposed implementation of the recommendations. Bold text indicates where primary responsibilities lie within each task.....	24

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There is consensus in the UNFC Adoption Group on the recommendations shown in Section VI. All mentions of UNFC refer to UNFC (2019) (UNECE, 2019).

This report is an explanatory background for the recommendations in Section VI. Every effort has been made to include relevant and substantial elements reflecting the views of the Group. The subjects covered are broad and operations will be influenced by conditions related to resources, development stages, jurisdictions etc. that it has not been possible to address in this explanatory document. While a proposed implementation of the recommendations is included in Section VII, the report is not binding on how recommendations should be implemented. Hence, while accepting the report, individual contributors and their respective employers/organizations were not asked to express agreement with every statement and view contained in this document.

Executive Summary

At the fourteenth session of the Expert Group on Resource Management, there was strong support expressed to look into the opportunity of accelerated UNFC adoption in the context of the urgency and importance of attaining the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). In particular, there was a request that a new working group should investigate the challenges of widespread adoption and formulate recommendations to the Expert Group for consideration and implementation. This report answers the request and is being presented to the fifteenth session of the Expert Group with the expectation for the Expert Group to consider implementing its recommendations - it is a call for action:

- Eight recommendations are provided in Section VI
- Section VII then details, how each of those recommendations could be implemented and by whom.

Notably, additional resources will be needed to implement those recommendations and different resourcing options are provided.

To begin with, the report highlights the need to communicate the purpose of UNFC from a user perspective. It is to provide decision makers with the information they need to take complex decisions which they face in sustainably managing natural and secondary resources. This information, which may be aggregated to the entity level, concerns project status and all the metrics of project impact which users require. Most resource sectors have well-established standards in resource volume classification and management systems. The added benefits of adopting UNFC needs to be understood, not only in accounting for source volumes and products, but in quantitatively assessing and comparing resource projects in their socio-economic and environmental impact included in time. This multifaceted assessment speaks directly to the pressing needs of decision makers in resource management, be it in private or public organizations. They look into how to do sustainable development and how to decarbonize their portfolios, whilst addressing the needs for prosperity of people and planet within their accountabilities. The increasingly complex decisions require cooperation between stakeholders. By establishing standardised project metrics UNFC provides the opportunity for stakeholders to share information, as a basis of dialogue to achieve mutually beneficial decisions.

This leads to the second recommendation of this report – the application of the decision taken by the Expert Group on Resource Management at its thirteenth session regarding the inclusion in UNFC of metrics that projects carry and that users need. The recommendation includes standard metrics for instance of private and public net-present value, green-house gas emissions, local employment, and more. An initial short list of metrics most UNFC adopters would need, is proposed and for those, guidance in how to use them should be provided.

Once the purpose is understood, and metrics are defined, potential adopters will wish to see compelling use cases, contact organizations that have championed adoption, and will look for user support, like training, help line etc. They wish to know what specifications to follow in their sector and how to bridge to existing standards. And finally, a digital solution enabling cost-effective compilation, quality assurance, processing, storage and analysis of their data and information would be extremely helpful in introducing UNFC adoption for any organization reporting on, or making decisions in, sustainable resource management.

The emphasis of the recommendations is on constructive Public-Private Partnership between resource governance, business management and capital allocation. The report explains how resource governance may apply UNFC in supporting decisions on shaping the framework conditions that will allow industry to deploy their best capabilities to attain the Paris Agreement and the SDGs. This will need to be done in a fast-changing world as reforms and strategic changes take hold. It will also need to be done in ways that capital allocators can finance. Resource governance, business management and capital allocation will be dynamic and should be integrated with each other to take advantage of the flexibilities that each party hold to facilitate the function of the other two, while protecting their own legitimate interests.

To manage this for the set of activities that UNFC covers, and across their stages of development and in different jurisdictions, requires dialogue based on common information, using UNFC.

The complementary efforts of academia, research and development organizations, professional bodies and the public should also be served by UNFC.

A summary of the challenges for each of the three parties of the Public-Private-Partnership in providing UNFC-based decision support and for shaping a digitally enabled information management and analyses is included in Section IV and elaborated in Annex I.

A set of additional metrics covering physical, economic, environmental, and social metrics is recommended to be developed. An example is provided in Annex II.

Parties will be affected to the extent specified by the legal rights they hold to participate in the projects including the project cash flows, i.e. the assets they hold. Recommendations cover the transformation of metrics from project to asset and entity, i.e. for capital allocators, corporate and government bodies.

Public interests will impact developments. In this report it is assumed that these will affect decisions through their influence in the three parties of the Public-Private Partnership. The emphasis on data management and communication is essential in this regard, and to provide information in the public domain of a quality required for public consensus to develop and endure over long project lifetimes.

Adoption of UNFC will require support. The report recommends building on existing organizations, the Bureau of the Expert Group on Resource Management with central capacity provided by the UNECE Secretariat and the International Centres of Excellence on Sustainable Resource Management (ICE-SRMs). It is recommended that adoption support of UNFC is initiated in a few key areas to both help interested first users and to collect experience that may be used in shaping the permanent support activities.

The key take-aways are expressed in Section VI – Recommendations, and Section VII – how to implement those. The Annexes of the report provide:

1. A full description of the considerations made under each of the five themes, namely resource governance, business management, capital allocation, cooperation and integrated dynamic capabilities and digital enablement.
2. A list of recommended metrics.
3. Advice on accounting and decision testing.
4. A summary of stakeholder responses to a questionnaire circulated to gauge opinions on the subjects addressed.

I. Introduction

1. In 2021, the UN Secretary-General issued his report on Transforming Extractive Industries for Sustainable Development (United Nations, 2021). One of his calls for action was:

“15. Implement a shared principles-based, integrated, sustainable resource management framework using tools such as the existing United Nations Framework Classification for Resources (UNFC) and the United Nations Resource Management System (UNRMS) under development.”

2. In making this call for action, the Secretary-General was building on decades of work by acknowledged experts around the world developing UNFC, a method that is meant to support sustainable development of resources in UN Member States. But why does it need a call from the Secretary-General, why is there not widespread adoption already, if UNFC is so valuable? Have target user groups understood the purpose of UNFC and what it can do for them? Is this only a communication challenge? Have there not already been numerous use cases and guidance documents published, seminars, webinars and workshops held?

3. Another quote from the Expert Group on Resource Management at its fourteenth session may provide further insights: *“If I wish to adopt UNFC for the first time, where can I go for help”*, a request by an attendee that was left unanswered. This quote suggests even for those convinced and wanting to adopt UNFC, there are challenges. It seems the understanding of what UNFC is all about, why it is of value, how it can be implemented and by whom, who should act, who supports it, might be different from those internally working within the Expert Group on Resource Management, and those external to that Expert Group and for whom UNFC has been developed. Analysing these challenges and recommending actions, that the Expert Group on Resource Management can decide to take to enable accelerated UNFC adoption, is the purpose of this report.

4. The authors have taken a user-centric perspective, not from expert group to users, but the reverse: To enable resource management for sustainable development requires a good understanding of the targeted users of UNFC – what are the needs of those who manage resources, or those who are stakeholders in decisions on resource projects, and why should they use such UN tools? This understanding reveals key barriers to adoption and leads to the recommendation of what mitigating actions should be taken, by whom, why and how to ensure increased adoption of UNFC.

5. The work compiled here is not to be regarded as comprehensive; but rather initial actions with suggestions on what needs to happen urgently in support of strengthening the resilience of UN Member States with respect to resources and resource management. The report recommends actions that the Expert Group on Resource Management and its Bureau and Working Groups can support.

6. Eight recommendations are presented in detail in Section VI. They are:

- (i) Communicate and promote the purpose of UNFC.
- (ii) Add Metrics that Matter.
- (iii) Establish Alliances with Standard-Setting Organizations.
- (iv) Develop Strategic Use Cases.
- (v) Engage with Potential Adoption Champions.
- (vi) Ensure that the Bureau and the Working Groups of the Expert Group on Resource Management have capacity to support wider adoption of UNFC (and UNRMS).
- (vii) Update UNFC Supplementary Specifications.
- (viii) Digitalize enablement.

7. To meet the SDGs, requires integration of the efforts of resource governance, business management and capital allocation in resource management, and this needs to be dynamic

and digitally enabled to remain relevant in a fast-changing world. UNFC provides the clear, consistent, project-based information which decision-makers require in taking the complex decisions which they face for sustainable resource management.

8. The recommended actions will help enable the desired acceleration of UNFC adoption to support the urgently needed informed dialogue and decisions regarding resource management for sustainable development and the global climate change challenges.

9. The challenges in sustainable resource management are multi-faceted and complex. They require informed dialogue and decisions at project and portfolio level, with consequences for the environmental, social, economic, and physical aspects of activities affecting stakeholders. It remains complex at project, corporate, local, national, regional, or intergovernmental level. Standard information based on key metrics can facilitate dialogue and support decisions that lead not only to a good outcome for prosperity, people, and the planet, but also most importantly for partnerships and peace, the five pillars of the SDGs.

10. The recommendations of this report reflect that the full potential of UNFC to support decisions towards sustainable development have not yet been realized. Implementing the recommendations needs planning, resourcing, and action. Voluntary and unpaid contributions from experts alone, as essential as they are, will by no means be sufficient to realize the full potential of UNFC and UNRMS. It is recommended that the Bureau of the Expert Group on Resource Management oversees planning, organization, and resourcing for the recommended activities for 2024 and beyond.

11. UNFC is project-based and, as such, is also a framework for decision support for assets and entities. It connects primary and anthropogenic resource production projects, where the products of one become the source of the next. In this way it links primary and secondary projects of the circular economy.

12. UNFC is unique in its capability to compare and contrast projects of the same, or across different, resource types and aggregate project metrics at portfolio, national or regional levels. It is also unique in the opportunities it offers to enhance the Public-Private Partnership over time, so as to steer activities to achieve the SDGs and to get more out of the natural and anthropogenic endowments. UNFC is valued as a transparent, easy-to-use framework for sustainable resource management. It is applicable globally and will, when adopted broadly, significantly simplify the work of preparers by providing a single classification for multiple users (management, government, partners, capital allocators and the public). Various use cases have been published, primarily adopting UNFC as a reporting standard at Member State level. However, UNFC is not well recognized beyond a classification and reporting method for resources and is not well known beyond the UNECE Expert Group on Resource Management. Most importantly, it is not yet used as a tool to support decisions in resource projects and portfolios. This justifies the initiatives described in this report.

13. The report serves two goals: (i) to recommend actions, and (ii) to capture the comprehensive insights of the UNFC Adoption Group gained from its work and meant for those wanting to implement the recommendations.

II. The purpose of UNFC: information for decision support

14. UNFC adoption must respect local and national conditions. Whilst resource management decisions are decentralized, being taken by individual governments, industries and capital allocators, the UN should ensure that the UNFC adoption is standardized to the extent necessary to facilitate the necessary international interactions:

- Between governments.
- Through transnational industries and their supply and product chains.
- In the global capital market.
- For the provisions of resource resilience, i.e. the securing of affordable and sustainable resource-based services for a large and growing population coming out of poverty.

15. UNFC is fit for this purpose because it is a single project-based classification designed to apply to a range of important activities. The ones it is designed to accommodate so far are shown in Figure I.

Figure I

United Nations Framework Classification for Resources applications (Nuclear fuel resources are included under minerals)



16. Projects are classified according to their environmental, social, and economic viability (E Categories) and their technical feasibility, i.e. stage of development (F Categories) separately. UNFC can hold the quantities that projects carry and that users need (G Categories). Those are the metrics, categorized with respect to the confidence in the estimates, see Figure II. Hence UNFC can provide decision makers with the information they need to take complex decisions which they face in sustainably managing natural and secondary resources.

Figure II
United Nations Framework Classification for Resources in two-dimensional form*

Product sold or used		Technical Feasibility (F) Categories											
		F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4.1	F4.2	F4.3
Environmental - Socio - Economic (E) Categories	E1.1	x											
	E1.2												
	E2												
	E3.1	x											
	E3.2											x	
	E3.3												
Products unused or consumed in operations													
Estimates with degree of confidence (G) Categories	G1	High											
	G2												
	G1+G2	Medium											
	G3												
	G1+G2+G3	Low											
	G4.1										High		
	G4.2												
	G4.1+G4.2										Medium		
	G4.3												
	G4.1+G4.2+G4.3										Low		
Probability of discovery											100%		

* Adapted from: <https://unece.org/sites/default/files/2022-11/UNFC%20GUIDANCE%20EUROPE-FINAL.pdf> (UNECE, 2022)

Note:

The colour scheme reflects the following:

- Magenta: Resource potentials associated with G4 estimates for which recovery projects are not conceived.
- Blue: Exploration potentials to define Projects capable of producing products from the “magenta” classes.
- Red: Projects or sub-Projects that may not produce products for sale or use. They either produce products for internal project use or no use, are not well enough defined to address the environmental-socio-economic conditions or have been abandoned.
- Yellow: Projects contingent on resolution of environmental-socio-economic (E) or physical (F) conditions.
- Green: Projects in execution.

17. Enhanced decision support is of value to each of the three principal activities of the Public-Private Partnership (resource governance, business management and capital allocation) when these are working in isolation. But working in isolation will not be enough to handle the reforms of the energy system required to meet the climate challenge and to meet the SDGs. The activities need to be conducted in concert and be digitally enabled.

18. Whilst interests between the parties differ, the dialogue required to forge the Public-Private Partnership is critically dependent on sharing relevant information on projects and portfolios of projects. The information that is disclosed in the partnership or in the public domain will be decided by either the owner of information or by regulation. Adoption of UNFC for public or private use must not be confused with the disclosure of UNFC information. They are two distinct and independent issues built on a common standard.

19. The interaction between the parties is complex and unfolds in detail over the different activities covered and through the handling of uncertainty measures of the metrics. Uncertainty estimates are necessary for assessing and managing opportunities and risks. Governments, industry, and capital allocators will depend on digital enablement to access complex consistent and coherent information to get their jobs done.

20. Coherence in the information disclosed to the public will help constrain public dialogue to the domain of reality and thus facilitate the enduring consensus that is required to manage projects and policies that often span decades and election periods and depend on predictable flexibility to excel.

III. UNFC Facilitating an Informed Dialogue for Sustainable Resource Management

21. Typical joint actions of the Public-Private Partnership of government, industry and capital allocators show the differentiated value proposition of adoption of UNFC to provide information for decision support:

- Facilitating building the roadmaps to net zero emission economy regionally and globally.
- Economizing resource consumption.
- Protecting values at the source of production.
- Rebalancing regional and national access to resources.
- Designing for benign environmental, social, and economic solutions.
- Managing opportunities and risks for projects and portfolios.
- Provide trusted science-based information to the public, academia and non-governmental organizations and civil society.
- Simplifying the tasks of preparers, users, and data managers.

IV. Key learnings from the themes

22. Comprehensive analyses have been performed on the five themes. Results are reported in Annex I. Some learnings of principal concern are included here.

A. Resource Governance

“To achieve net-zero, we also need to deploy clean energy technologies at pace and scale.

The extraction of critical minerals for the clean energy revolution — from wind farms to solar panels and battery manufacturing — must be done in a sustainable, fair, and just way.

Demand for these minerals is set to increase almost fourfold by 2030.

At my Climate Ambition Summit, I heard repeated calls from G77 leaders for their countries and communities holding these minerals to fully benefit with maximum local added value.

We cannot repeat the mistakes of the past with a systematic exploitation of developing countries reduced to the production of basic raw materials.”

UN Secretary-General at COP 28²

² https://www.un.org/sg/en/content/sg/statement/2023-12-02/secretary-generals-remarks-g77china-cop28-leaders-summit-delivered?_gl=1%2A1nce1pr%2A_ga%2AMzEzNDE1NjU4LjE2OTMxMTc4NTE.%2A_ga_S5EKZKSB78%2AMTcwMjU3Mzk4OS4yLjEuMTcwMjU3NjM1NC42MC4wLjA.%2A_ga_TK9BQL5X7Z%2AMTcwMjU3Mzk4OS40LjEuMTcwMjU3NDU5OC4wLjAuMA

23. The purpose of resource governance is to orchestrate the framework conditions to address the requirements of the Paris Agreement and the SDGs. The framework conditions need to be dynamic and responsive to changing conditions.

24. The evolution of the framework conditions will need to be predictable. Industry and capital allocators depend on predictable flexibility to manage the opportunities and risks associated with their engagements. Framework conditions must nevertheless change as realities change. Predictable flexibility is at the heart of decision support for integrated and dynamic cooperation in the Public-Private Partnership between resource governance, business management and capital allocation.

25. Resource governance is the central activity in resource management for sustainable development. It is part of Member States' sovereignty and includes:

- Building national capital in the form of safeguarding and making available knowledge of the resources and of the environmental and social consequences that can be expected from recovering and using them. If this information is available early, before large investments are made, much can be saved. It will be an important basis for providing industry with appropriate access in time and space.
- Securing a high value for the resources at the point of production. This is necessary to facilitate production. A resource that does not have sufficient value at source to be produced will not be recoverable. This affects all the marketing efforts and all physical, legal, regulatory, fiscal³ and contractual measures between the market and the point of production that impact the value at the source. The importance of this is partly determined by the physical irreversibility of the processes involved in recovery and that will reduce gains irreversibly if they are not designed to be achieved through the early shaping of the projects. Falling for the temptation to skim the cream early is bound to cause underground invisible waste of large economically marginal resources needed. (Norway, 2023).
- Regulating hard and soft infrastructures in support of exploration, design, development, production, manufacturing, reuse of products and waste and decommissioning. Hard infrastructures are typical for provision of transport, energy, water, other supplies, and urban structures, while soft infrastructures provide services for health, education, research and development, and other social needs.
- Regulating standards such as UNFC, but not only. Resource governance will benefit from common model agreements in several fields. These are usually negotiated between the parties and enacted by government. This includes various agreements, including joint venture agreements, accounting agreements and other routine agreements in general use. In jurisdictions using negotiated fiscal systems (e.g. production sharing agreements) much administrative benefit can be gained if all agreements are coherent in form.
- Incorporating resource governance measures in laws and regulations.

26. Resource governance can be performed in a reactive mode, where government responds to industry initiatives or, in a proactive mode, where industry is invited to act in a way aimed at getting the most out of the national endowments. Both are practiced, sometimes in a single country.

27. Proactive resource governance can be more efficient, from a national point of view, provided government has developed the necessary capability, and can retain it. Proactive governance will require more extensive decision support for resource governance than reactive governance.

³ Fiscal measures which prescribe gross taxes, i.e. royalties and fees will be a cost to the payer and reduce his value at source whereas a neutral tax, also known as Brown tax, cash flow tax, state direct financial interest or government entity participation will not. This will also be easier to use for aligning economic interests between public and private entities provided both parties are able to management the shifts in opportunities and risks that follow.

B. Business management.

28. Industry provides essential capabilities. In this context, capability is understood to be corporate understanding of what needs to be done, qualification and skill to do it and capacity to deliver at the required scale.

29. Capability will need to be dynamic to handle the significant volatility expected to occur during the reforms. Volatility will be caused by necessary changes in resource governance. This could be the banning of greenhouse gas emissions, and/or other environmental and social restrictions. It will be caused also by market changes including changes in supply and demand, changes in competitive technologies, and changes in political necessities.

30. Industry will need to secure capability to manage flexibly through the reforms, respecting the capabilities and restrictions that all parties hold in the Public-Private Partnership.

C. Capital allocation

31. At COP 28, the UN Secretary-General said inter alia²:

“The outdated international financial architecture must be reformed to reflect the realities of today and to respond to developing countries’ needs including in relation to the Bretton Woods system.

The international financial system must provide an effective debt-relief mechanism that supports payment suspensions, longer lending terms, and lower rates.

All international financial institutions must align their policies, plans and programmes with the Paris Agreement.

And we need to see an increase in the capital base of the Multilateral Development Banks; and reform of their business models so that they leverage far more private finance at reasonable cost to developing countries.”

32. Activities will need to receive capital to materialize. Capital allocation is described in Annex I.C.

33. Reforms will depend on the capabilities of capital allocators in financing the activities, and they vary between capital allocators. While some projects, assets or entities may be financed by a single allocator, the very significant investments required to live through and realise the reforms will often require several capital allocators, and also several types of capital allocators. This will mobilise a larger capital base and facilitate the allocation of opportunities and risks in accordance with each contributor’s capability and portfolio to manage it. Both the choice of capital allocators and the structuring of their contributions will add to the flexibility required by the Public-Private Partnership.

34. Developing and developed countries see quite different modes of finance, where private finance, and thus capital availability is much more available in developed than in developing countries. It may be hoped that patterns of capital allocation can be developed during the reforms where these differences diminish.

D. Cooperation and integrated dynamic capabilities

35. Resource governance, business management, and capital allocation will not by themselves solve the climate challenges or drive the reforms required to meet the SDGs and other national or regional strategic goals. Cooperative activities are required where each party is aware of and able to adjust to the capabilities of the other parties in such a way that the Public-Private Partnership excels in its endeavours to perform.

36. This will not take place in a vacuum. Academia, professional bodies, and the public must be informed in ways that allow them to contribute to and support the efforts. NGOs and

stakeholder groups might be seen as a proxy to the public at large, using UNFC as a basis for an informed debate on resource projects across all stakeholders.

37. Change is always difficult, but in this case essential. There is a need to change more quickly and substantially than in the recent past. In this process, all parties will be challenged to do well in the functions they are conducting, whether this is to operate existing energy systems or other major systems which are liable to change and to cause change. The parties should do so in a such a way that the capabilities that are developed through active operations are also developed in a manner that makes them transferrable for application in the changed systems. With the science, technology, and digital tools available today, this is easier than before, but it requires conscious efforts to learn and to change.

E. Digital enablement

38. Users and preparers will need the decision support to be digitally enabled to meet the needs across the different industries and jurisdictions. This will be critical to save time, cost, and efforts while offering shared cost of providing security. Users as well as preparers will need to exchange and collect, quality-assure, process, store and analyse data covering all the metrics that are needed in their respective organizations. Digital enablement means, there are standards and guidance available to do this in a consistent and digital way⁴. This has significant cost-saving potential and in itself might be a strong argument for organizations adopting UNFC.

39. In detail, this means that a rigorous and standardized form of UNFC-based communication is required, including similar and complementary taxonomies to those developed for other purposes and in particular by the International Financial Reporting Standards Foundation (IFRS Foundation) and the European Financial Reporting Advisory Group for financial reporting.

40. Digital enablement will rely on the existence of a common and open data structure available to all. Parties entering their information in this structure will have control over its use and dissemination. It could be for the use of the preparer's team only, its management, partners, governments, the UN, its capital allocators, or the public. Disclosure would be separate from collecting and storing the information. As mentioned already, disclosure is a decision to be taken by the owner of the data unless legally obliged to disclose the information. Ownership and disclosure should never be confused.

41. Once in place within the adopting organization, the systems will, to the extent allowed, be searchable by simple search engines, by standards search systems like Inline eXtensible Business Reporting Language (iXBRL) that introduces both human and computer-readable tags as the standard format for all companies' financial statements tagged in Extensible Business Reporting Language, or other forms of web crawlers including those which support artificial intelligence.

42. Rigor will be necessary for monitoring and managing the actions of Public-Private Partnerships during future changes to societal needs. It will offer significant improvements in quality over today's basis for producing the broad scenarios and other analyses on which assessments of opportunities and risks of new and ongoing engagements are made.

43. Digital enabled decision support is not just facilitating the task of preparers and users, it is the king pin in allowing Public-Private Partnerships to function.

⁴ See the [Diskos](#) system as one example.

V. Common barriers and recommended measures

Barriers to accelerated adoption

44. Analyses of the five themes described in Section IV and Annex I have identified common barriers for the accelerated adoption of UNFC to provide decision support for sustainable development. The recommendations of Section VI seek to mitigate these. The following is a summary of the barriers:

45. **Lack of understanding and conviction of benefits of UNFC versus costs or other impacts.** There is a lack of awareness and understanding of the role and benefits of applying UNFC for decision-making among resource owners, capital allocators, regulators, industry, and consumers. Whilst lack of understanding of the benefits exist, there is a related concern about the costs in time and effort (or perceived costs), especially for companies/stakeholders that are managing cash costs and may see UNFC only as an additional cost. Another concern is the potential impacts of UNFC on resource governance, environmental sustainability, human rights, and social justice. UNFC encourages responsible and sustainable resource governance. In regions with weak governance structures or corruption, there may be hesitancy to adopt UNFC, as this could expose weaknesses which are difficult to address.

46. **Other classification standards.** A doubt about adopting UNFC is that other classification standards exist. There is a resistance to change from existing practices and standards that are well-established and widely used in the industry. There is also a financial cost associated with this change, including the training and capacity-building, however the efficiency benefits that adopting UNFC brings outweigh this cost. Whilst some countries and regions have embraced UNFC, others continue to use their own classification systems. The lack of universal adoption can deter stakeholders from adopting UNFC.

47. **Legislation and/or adaption required.** Legal and institutional barriers may limit the harmonization and integration of UNFC with national and regional policies and regulations. The complexity and diversity of resource types, geographies, markets, and regulations may require customization and adaptation of UNFC. In this case, national or regional authorities may issue specifications and guidelines, emphasizing where their needs require customization of the otherwise standardized UNFC methodology.

48. **Lack of qualification, and/or technical and operational challenges.** There is a lack of resource managers and other practitioners with sufficient knowledge and skills. Technical and operational challenges may also hinder the development and deployment of UNFC-compatible tools and systems. This includes concerns about the availability, quality, and consistency of the necessary data. Another technical challenge is that although there is recognition of the need for digitalization it is challenging to achieve it in practice.

VI. Recommendations

49. The UNFC Adoption Group⁵ has considered measures that will facilitate accelerated adoption of the UNFC methodology by resource governance organizations, business management and capital allocation, and that may also include adoption by academia and the public.

50. The UNFC Adoption Group recommendations aim to support governments in establishing framework conditions that allow businesses to deploy their best capabilities in ways that capital allocators can finance to reach the Paris Agreement and the SDGs. This should secure affordable and sustainable resource-based services for a large and growing population coming out of poverty.

51. The recommendations are focused at UNFC users and tailored to serve the Public-Private Partnerships involved in the resource activities, in enabling informed dialogues and decisions on sustainable energy and Critical Raw Materials supply and building

⁵ <https://unece.org/unfc-adoption-group>

decarbonization roadmaps, all for which UNFC has been developed. It is foreseen that the application of UNFC should be digitally enabled. It can be extended to also include activities beyond the ones it currently is covering.

52. The UNFC Adoption Group recommends that the following eight actions are considered for approval by the Expert Group on Resource Management at its fifteenth Session. The actions are to be owned by the Bureau of the Expert Group on Resource Management:

53. **Communicate and promote the purpose of UNFC** from a user perspective beyond classifying and accounting resource volumes: UNFC is meant to provide comparable information for a wide range of resource projects along their technical, environmental, and social value chains, to enable informed dialogue and decisions in sustainability. UNFC is uniquely positioned to support users addressing multifaceted challenges like decarbonizing project portfolios, building resilience in energy and in critical raw materials. The Bureau of the Expert Group on Resource Management is recommended to deliver a promotion strategy with user-specific activities and communication material to cater for the specific needs of target groups in governments, business, finance, and the public at large.

54. **Add Metrics that Matter** – the Expert Group should work towards extending UNFC to include physical, economic, environmental, and social metrics that projects carry, and most users need in addition to quantities and qualities of sources and products. The initially recommended metrics are listed in Annex II.

55. **Establish Alliances with Standard-Setting Organizations** – the Expert Group should continue to develop strategic partnerships with established organizations and standards for industry sectors, finance, and national and international legal and regulatory bodies seeking to implement sustainable resource management. This could include agreeing with such organizations specifying mutual support in how to accelerate resource management for sustainable development, supporting implementation of the 2030 Agenda and achieving the SDGs. The Expert Group is recommended to develop bridging guidelines to other standards where necessary.

56. **Develop Strategic Use Cases** – that is to actively support a few highly compelling cases showing tangible benefits in facilitating informed dialogue, testing key metrics, leading to constructive Public-Private Partnerships in resource management for sustainable development, as show cases for others to follow.

57. **Engage with Potential Adoption Champions** – to facilitate negotiations on the further extension of common standard applications of UNFC in resource management ranging from governments and public organizations to researchers and industry implementers and investors. It is recommended that the Expert Group continues to facilitate cross border adoption of proven and agreed standard applications.

58. **Establish UNFC support capacity** – within the Expert Group and with the possibility for all UN Member States to participate on an equal basis - to oversee consistent use ('common language') of UNFC and enable capacity-building. This should also involve coordinated International Centres of Excellence on Sustainable Resource Management and should include aligned strategies for training, templates, helpdesks, platforms for collaboration, data and digital enablement, qualified persons, and building trust in reported information. All global standards rely on effective support organizations (like the International Organization for Standardisation, International Financial Reporting Standards Foundation, etc.). It is recommended that the Expert Group and its Bureau and Working Groups continue to coordinate and supervise the alignment on UNFC adoption and that the Expert Group continues to look for resources to support this. The ICE-SRMs should support this. This work will support the adoption of the United Nations Resource Management System (UNRMS).

59. **Update UNFC Supplementary Specifications** – to complete the consolidation of the specifications to align with UNFC (2019) where this has not already been done.

60. **Digitalize** – initiating common, open source digitally supported data management and analysis systems for the application of UNFC for resource management in supporting

sustainable development. This includes digitally enabling the processes of data collection, quality assurance, processing, storage, retrieval, and analysis.

61. **Importantly**, it is recommended that in owning these activities, the Expert Group adequately plans, resources, and coordinates the activities for 2024 and beyond to the extent possible. Adequate funding of these activities financially and in-kind, by stakeholders, is recommended as critical given the urgency in progressing the 2030 Agenda and in accelerated adoption of UNFC and UNRMS in direct support thereof.

62. These recommendations were agreed by all members of the UNFC Adoption Group in January 2024.

VII. Proposed Implementation of the Recommendations

63. This proposal to implement the recommendations made in Section VI respects that resource management is the privilege of UN Member States. It also recognizes that Member States, international industries and non-government capital allocators need to cooperate in a global context to deliver on climate change mitigation and SDGs. This requires enduring capabilities i.e., qualification plus capacity to negotiate and monitor the application of global standards and information on which to cooperate, as the Expert Group on Resource Management and its predecessor UNECE bodies have been doing on a smaller scale for the last 30 years with respect to UNFC. It also requires capabilities in Member States, industries, and capital allocators, not just to perform their current tasks as they will need to do until change is safely accomplished, but also to perform the changed tasks as change takes hold.

64. Essentially, the UNFC Adoption Group sees five main stakeholder groups participating in accelerated UNFC adoption, which would benefit from, and should consider, the respective UNFC implementation activities recommended in this report:

- Member State and Transactional⁶ organizations tasked with national resource management, at times collaborating with neighboring states for synergies such as International Centres of Excellence on Sustainable Resource Management – hereafter collectively named **National/International Centres**
- A global **UNFC support body, in essence the Expert Group on Resource Management**, including the Bureau, working groups, task forces and ICE-SRMs with whom UNECE has entered into an MoU. The Expert Group should facilitate negotiations and maintenance of standards for consistency and alignment and for support building and maintaining the capabilities
- **Industry** executing industrial capability and testing and implementing UNFC at project and entity level
- **Capital allocators**, e.g., lenders, shareholders, governments (through the fiscal system and otherwise) and stock exchange regulators
- **Other organizations** such as professional associations, standard organizations, academia, NGOs – as these are also stakeholders with constructive influence on Private-Public Partnerships.

65. Additional staff and funding are needed in all stakeholder organizations. Member States are managing their resources today often involving both the inner (cabinet and ministries) and the outer state (subsidiary directorate, geological surveys, offices of statistics, international development agencies etc.). If they choose to adopt UNFC in their resource management procedures, including rules and regulations, they will need dedicated expert resources for implementation. There will likely be a time lag between mobilizing staff and funding for introducing UNFC and decommissioning the same from the activities that adopting UNFC makes obsolete. Over time, the efforts of implementing UNFC will be compensated in some organizations by a reduction of efforts resulting from the more effective integrated process introduced. The simplification in resource governance and management, in collecting, storing, processing, analysing, and taking decisions based upon UNFC

⁶ Such as EU bodies.

information, within respective Member State governments and authorities, is expected to provide significant cost and staff savings, especially through the additional metrics. This is likely to far outweighing the staff required for UNFC adoption. If this dynamic of change, with an initial strengthening of capabilities followed by rationalisation, is not respected, the result will be that either existing activities are curtailed at great cost or that change will not be implemented at even greater cost.

66. Some Member States may decide to pool their resources in ICE-SRMs. This may be cost-effective and generate synergies. However, it will not relieve the Member States from implementing legislation and standards to meet their specific goals. Their leaders will as always be responsible for both what they do and what they do not do.

67. For the Expert Group to continue to lead development and dissemination of UNFC and UNRMS and drive implementation of the recommendations in Section VI as elaborated below, it is necessary to secure firm governance from UN Member States through UN intergovernmental bodies, currently the Committee on Sustainable Energy. The Bureau should translate such governance into directing the activities of the Expert Group and maintain focus.

68. The proposed primary responsibilities to implement the recommendations are shown in Table 1. A more detailed breakdown of tasks and responsibilities for each recommendation is shown in Table 2.

Table 1
Primary responsibilities

Under the Direction of the Bureau of the Expert Group Management	<p>Expert Group on Resource Management Secretariat will convene stakeholders and manage, administer, and communicate the work to establish UNFC as a common information framework for decision-making in Public-Private Partnerships for Sustainable Resource Management</p>	<ul style="list-style-type: none"> Facilitate the development, resourcing, and monitoring of the UNFC adoption plan. Convene early adopters and adoption champions from amongst national bodies, companies, capital allocators and digital enablers to share and develop demonstration use cases of UNFC for decision-making in Public-Private Partnerships. Convene stakeholders to share, develop and negotiate transnational methods/standards and build alliances with standard setting organizations. Communicate UNFC purpose, benefits, and standards. Support national capabilities and International Centres of Excellence on Sustainable Resource Management and establish contracts. Establish strategic partnerships with adoption champions. Facilitate the development, monitoring, maintenance, and protection of UNFC, its transnational project metrics, and digital enablement standards. Facilitate comparison with other classifications including bridging. Manage Bureau of the Expert Group on Resource Management membership and networks.
	<p>Expert Group on Resource Management Working Groups and Task Forces will provide supporting technical expertise and guidance</p>	<ul style="list-style-type: none"> Develop and monitor adoption plan and help Secretariat to identify sources of funding. Assist the Secretariat in identifying and convening early adopters and adoption champions. Assist national bodies and companies to develop demonstration use cases. Develop and maintain methods, standards and bridging for UNFC, project metrics and for digital enablement. Develop and deliver communication and training material on UNFC purpose, benefits, methodology and standards. Provide technical support and advice to national bodies and International Centres of Excellence on Sustainable Resource Management in adopting UNFC, developing capabilities, maintaining standards, methods, and quality control. Assist in identifying and developing strategic partnerships with adoption champions.
	<p>National/International Centres⁷ will be the primary adopters of UNFC as a common information system to facilitate Public-Private Partnerships for Sustainable Resource Management</p>	<ul style="list-style-type: none"> Organize national/regional capabilities and enter agreements with UNECE. Adapt, mandate, and regulate standards and methods to national needs (including control and certification requirements – respective legislative and regulatory authorities are encouraged to adopt guidance for UN methods and standards for global consistency). Tailor and deliver executive education/capacity building to stakeholder groups, training for preparers and users, maintain Research and Development and consultancy. Propose and develop case studies, with support from the Bureau of the Expert Group on Resource Management, in which UNFC is used as shared information for decision-making for sustainable development. Secure digital enablement & data management for Public-Private Partnerships.
	<p>Other stakeholders - Like industry, capital allocators including stock exchange regulators, professional bodies, academia, Non-Governmental Organizations - will adopt UNFC as a common information system to facilitate Public-Private Partnerships for Sustainable Resource Management</p>	<ul style="list-style-type: none"> Industry and capital allocators enter dialogues with other stakeholders and develop case studies in which UNFC is used as shared information for decision making for sustainable development. Standards setting organizations (for industry and finance), and legal and regulatory bodies, work with Bureau of the Expert Group on Resource Management and national/international centres for synergies. Industry and academia provide dynamic and digitally enabled integrated capabilities to a public-private partnership on resource governance, business management and capital allocation. Professional bodies and academia deliver education, train preparers and users, bridge to other sustainable standards, maintain Research and Development and consultancy.

⁷ Represent existing resource management entities in Member States, sometimes bundled in regional cooperation.

69. Implementation of the recommendations depends on a strong Bureau of the Expert Group on Resource Management and Member State capabilities:

- **A strong digitally-enabled Bureau of the Expert Group on Resource Management**, e.g. the Bureau of the Expert Group on Resource Management, the Expert Group's working groups, task forces, and the Secretariat supported by willing Member States, industry, capital allocators. They will negotiate internationally applicable amendments or changes to UNFC and UNRMS, communicate agreed methods (that Member States may transform into national standards) and ensure that they are practiced consistently and correctly when applied internationally. The Bureau, with its Working Groups and the Secretariat will host an environment for discussion and negotiation of issues of resource governance, business management, capital allocation and digital enablement that transgresses national boundaries.
- **Strong Member State capabilities.** Implementation depends on Member States. Member State organizational capabilities are present wherever resources are managed. The proposal is to strengthen and consolidate them, if necessary, not to build new organizations to complement or replace them. Member State-based organizational capabilities (qualifications + capacities) should take on the following functions:
 - Education, research, development and consultancies in resource governance, business management, capital allocation and digital enablement focusing on their proper needs
 - Training in information collection, analyses, reporting and data management
 - Legislation for resource governance, incl. resource, environmental, fiscal, contractual, and administrative legislation based on negotiations with national champions.
- Member States may find it useful to join forces with other States in forming joint International Centres of Excellence on Sustainable Resource Management, either for all the functions implicit in the UNFC Adoption Group work, or for some resources and some stages of operation, as is found for instance in Geological Surveys.

70. **Extrabudgetary resources** - To serve the Member States, industries, and capital allocators as they adopt UNFC and UNRMS, the Expert Group must be responsibly funded. First-hand experience with the implementation of UNFC in the EU Critical Raw Materials Act, once available, could provide a realistic check point of required resources.

71. At the current stage, it is estimated that the initial resources needed in the UNECE Secretariat would be three additional professional staff members. These would provide capacity to trigger momentum in accelerated UNFC adoption, by communicating the purpose of UNFC and how well it can provide consistent information and meet decision makers needs in their sustainable resource management. These resources would further help define the expanded metrics and coordinate initial support for early adoption champions. The proposed resources will be insufficient to deliver on all recommendations, but will likely create the pull for support, which may open additional resourcing options from those benefitting.

72. Extrabudgetary resources will not only be required for additional UN personnel, but also for effective functioning of the International Centres of Excellence on Sustainable Resource Management, for consultants paid or seconded in-kind, for travel and tools. It is the view of the UNFC Adoption Group that relying on voluntary pro-bono experts alone, e.g., through Expert Group on Resource Management Working Groups, will not be sufficient to facilitate accelerated UNFC adoption at the pace, quality and reliability needed to adequately support attainment of the 2030 Agenda.

73. Funding might be provided by interested Member States, regional bodies, industries, and capital allocators benefitting from the services provided by UNECE and centres in improving their Public-Private Partnership. These funds will be needed to ensure that there are efficient integrated and digitally enabled dynamic capabilities for navigating the successive changes required to meet the SDGs. Given the impact of this work on achieving these goals, resourcing may also be reasonably sought from trust funds and from UNDP.

Initially only some champion countries and organizations may engage. They should be invited to secure that the costs of the activities led by the Expert Group are covered. Some countries may be able to secure their contributions through agencies for development assistance considering the strong effect that sustainable resource management excellence has on their socio-economic development.

Table 2

Proposed implementation of the recommendations. Bold text indicates where primary responsibilities lie within each task

Recommendations	Task and Responsibilities				Comments
	Bureau of the Expert Group on Resource Management providing direction		National/International Centres	Others: industry, capital allocators, Non-Governmental Organizations, professional bodies, academia	
	Expert Group on Resource Management Secretariat	Expert Group on Resource Management Working Groups/ Task Forces			
<p>1. Communicate and promote the purpose of using UNFC from a user perspective beyond: UNFC is meant to provide comparable information for a wide range of resource projects along their technical, environmental, and social value chains and enable project monitoring and informed dialogue on decisions in sustainability. Bureau of the Expert Group on Resource Management is recommended to deliver a promotion strategy with user-specific activities and communication material to cater for the specific needs of target groups in governments, business, capital allocation, and the public at large.</p>	<p>Continue to support communications through networking and at stakeholder meetings. Revised focus on UNFC is as a common information tool for collaboration and decision making in Sustainable Resource Management. Manage the Expert Group on Resource Management membership and networks.</p>	<p>Communications Working Group, with support of other Working Groups, develops communications packs for different stakeholder groups on the use of UNFC as a common information tool for collaboration and decision-making for sustainable resource management.</p>	<p>Tailor and cascade communication to national, regional, and sub-regional bodies.</p>	<p>Tailor and cascade communication.</p>	<p>Focus on purpose: If sustainability, social impact or decarbonization is sought after, UNFC enables the solution, the way to get there. UNFC is a solution to a problem, not a tool looking for a problem.</p>
<p>2. Add Metrics that Matter – the Expert Group should work towards extending UNFC to include physical, economic, environmental, and social metrics that projects carry, and most users need in addition to quantities and qualities of sources and products. The initially recommended metrics are listed in Annex II.</p>	<p>Negotiate, distribute, and protect UN Standard metrics as these are developed and recognised to have global applicability.</p>	<p>Steer negotiations with help of Task Force/working group leads in development of standard metrics, Bridge to existing metrics.</p>	<p>Negotiate and agree metrics that projects carry and that users in their community need. Identify metrics that need international standardisation and seek their recognition by UN.</p>	<p>Contribute education, research and consultancy services related to decision support using recommended metrics.</p>	<p>Metrics task force or working group could be considered a new Expert Group on Resource Management non-resource specific task together with decision support.</p>
<p>3. Establish Alliances with Standard-Setting Organizations – the Expert Group should continue to develop strategic partnerships with established organizations and standards for industry sectors, finance, national and international legal and regulatory bodies seeking to implement sustainable resource management. This could include agreeing with such organizations specifying mutual support in how to accelerate resource management for sustainable development, supporting implementation of the 2030 Agenda and achieving the Sustainable Development Goals.</p>	<p>Continue to lead in establishing strategic partnerships and setting up Memoranda of Understanding with standards-setting organizations, legal and regulatory bodies.</p>	<p>Expert Group on Resource Management experts support Secretariat in establishing strategic partnerships.</p>	<p>National authorities to regulate relevant UN methods. Governments and policy makers may consider UNFC to become part of their regulatory framework within the resource management of their jurisdiction.</p>	<p>Organizations which set standards for industry sectors and finance, and national and international legal and regulatory bodies seeking to implement sustainability. Work with Bureau of the Expert Group on Resource Management and national and international centres.</p>	<p>A standards priority list should provide focus, e.g., metrics, digital enablement, UNFC-based sustainability financial reporting.</p>
<p>Bureau of the Expert Group on Resource Management is recommended to develop bridging guidelines to other standards where necessary.</p>	<p>Check that proposed bridging documents are fully consistent with UNFC. When this is not possible, communicate the limitation of using bridging documents relative to using UNFC as defined.</p>	<p>Metrics task force/working group develop bridging to other sustainability/metrics standards.</p>	<p>Develop explanatory notes when legislating UN methods explaining how they relate to other standards.</p>	<p>Standards setting organizations work with Bureau of the Expert Group on Resource Management to develop bridging to sustainability/metrics standards.</p>	

Recommendations	Task and Responsibilities				Comments
	Bureau of the Expert Group on Resource Management providing direction		National/International Centres	Others: industry, capital allocators, Non-Government Organizations, professional bodies, academia	
	Expert Group on Resource Management Secretariat	Expert Group on Resource Management Working Groups/ Task Forces			
<p>4. Develop Strategic Use Cases - that is to actively support a few highly compelling cases showing tangible benefits in facilitating informed dialogue, testing key metrics, leading to constructive Public-Private Partnerships in resource management for sustainable development, as show cases for others to follow.</p>	<p>Convene companies and national bodies to develop use cases in which UNFC is used as shared information for decision making for sustainable development. Coordinate the substantial financing of efforts.</p>	<p>Help to identify potential cases and contacts.</p>	<p>Propose case studies in which UNFC is used as shared information for decision making for sustainable development.</p>	<p>Propose and co-develop case studies in which UNFC is used as shared information for decision making for sustainable development. Explore options to include e.g. MSc, PhD students to elaborate on case studies, and showcase in outreach events.</p>	<p>This recommendation addresses projects and groups of projects individually, and not necessarily in a specific context.</p> <p>Show what problems have been solved by this method, e.g., public/private opportunity and risk management, passing FID, national econometric analyses, roadmaps to GHG emission reduction, etc.</p>
	<p>Quality control and quality assurance of use case development projects before releasing them as valid illustrations of the use of UNFC.</p>	<p>Assist with case studies through advice and support.</p>	<p>Assist or advise on internal control procedures to ensure quality.</p>		
<p>5. Engage with Potential Adoption Champions – to facilitate negotiations on the further extension of common standard applications of UNFC in resource management ranging from governments and public organizations to researchers and industry implementers and investors.</p>	<p>Convene champions to negotiate and adopt UNFC common standard applications for decision-making, demonstrating its strengths, and protecting the standard.</p>	<p>Helping to identify potential adoption champions.</p>	<p>Governments and policy makers may consider UNFC to become part of their regulatory framework within the resource management of their jurisdiction. Then respective national authorities need to regulate relevant UN methods.</p>	<p>Provide digitally enabled integrated, dynamic capabilities to a public-private partnership on resource governance, business management and capital allocation.</p>	<p>This activity addresses major users of UNFC in specified wide ranging applications and usually in a portfolio context. This activity strives to work with (potential) leaders - people and organizations - that can trail-blaze the path to accelerated adoption more than individual use cases might (Point 4). Supporting those is critical to understand why it works for them, what does not work yet, and how to spread adoption further.</p>
<p>b. It is recommended that the Expert Group continues to facilitate cross border adoption of proven and agreed standard applications.</p>	<p>Facilitate dialogue between early adopters with common interests.</p>	<p>Support Secretariat in convening early adopters.</p>	<p>Engage champions with common interests to enter dialogue.</p>		

Recommendations	Task and Responsibilities				Comments
	Bureau of the Expert Group on Resource Management providing direction		National/International Centres	Others: industry, capital allocators, Non-Governmental Organizations, professional bodies, academia	
	Expert Group on Resource Management Secretariat	Expert Group on Resource Management Working Groups/ Task Forces			
6. Establish a UNFC Support Capacity a. within the Expert Group and with the possibility for all UN Member States to participate on an equal basis - to oversee consistent use ('common language') of UNFC and enable capacity-building. This should also involve coordinated International Centres of Excellence on Sustainable Resource Management and should include aligned strategies for training, templates, helpdesks, platforms for collaboration, data and digital enablement, qualified persons, and building trust in reported information. All global standards rely on effective support organizations (like the International Organization for Standardisation, International Financial Reporting Standards Foundation, etc.).	Continue to establish agreements and coordinate relationships between willing National centres, International Centres of Excellence on Sustainable Resource Managements and Bureau of the Expert Group on Resource Management. Monitor international coherence and take corrective actions when required.	Assist Secretariat in defining responsibilities and relationships with national capabilities and International Centres of Excellence in Sustainable Resource Managements.	Organize national capabilities, consider regional International Centres of Excellence on Sustainable Resource Managements and enter into agreements with UNECE.		It is anticipated that the described services need to be financed by the countries, companies and capital allocators who benefit from their services. National capabilities do exist in all countries in one form or another and are financed. Implementation of the recommendations seeks to reinforce these, not necessarily add new organizations.
		a) Maintain global UNFC/UNRMS standards, guidelines including on QA/QC, central training. b) Provide technical support and advice to International Centres of Excellence on Sustainable Resource Management: review standards, training, consistent certification, and application.	Adapt standards to national needs (including control and certification requirements), deliver education to stakeholder groups, train preparers and users, maintain Research and Development and consultancy. Seek support and verification from the Bureau of the Expert Group on Resource Management.	Deliver education to stakeholder groups, train preparers and users, maintain Research and Development and consultancy	
b. It is recommended that the Expert Group and its Bureau and Working Groups continue to coordinate and supervise the alignment on UNFC adoption and that the Expert Group continues to look for resources to support this. The ICE-SRMs should support this. This work will support the adoption of UNRMS.	Secure coordination and support, including resourcing and finance. Support national capabilities and International Centres of Excellence on Sustainable Resource Management and establish cooperation contracts.	See description.	Member States may provide funding for the Secretariat and the Bureau of the Expert Group on Resource Management working groups/task forces engaged beyond UN regular budget resources. Member States can also resources and fund the baseload activity of their Centres.		
7. Update UNFC Supplementary Specifications - to complete the consolidation of the specifications to align with UNFC (2019) where this has not already been done.	Bureau of the Expert Group on Resource Management to monitor Technical Advisory Group delivery.	Technical Advisory Group and relevant Working Groups complete updates of supplementary specifications			It is part of the credibility of UNFC to have these Specifications available.

Recommendations	Tasks and Responsibilities				Comments
	Bureau of the Expert Group on Resource Management providing direction		National/International Centres	Others: industry, capital allocators, Non-Government Organizations, professional bodies, academia	
	Expert Group on Resource Management Secretariat	Expert Group on Resource Management Working Groups/ Task Forces			
<p>8. Digitalize initiating common, open source digitally supported data management and analysis systems for the application of UNFC for resource management in supporting sustainable development. This includes digitally enabling the processes of data collection, quality assurance, processing, storage, retrieval, and analysis.</p>	<p>Bureau of the Expert Group on Resource Management, facilitated by the Secretariat, to organize, approve and protect international digital enablement standards for use in international UNFC-based decision support.</p>	<p>Develop implementation plan. Seek experts' input to implementation.</p>	<p>Secure digital enablement & data management for Public-Private Partnership.</p>	<p>Industry inputs to digital standards and open-source implementation.</p>	
<p>Bureau of the Expert Group on Resource Management adequately plans, resources, and steers the above activities for 2024 and beyond it is recommended that in owning these activities, the Expert Group adequately plans, resources, and coordinates the activities for 2024 and beyond to the extent possible. Responsible funding of these activities financially and in kind, by stakeholders, is seen as critical given the urgency in progressing the 2030 Agenda and in accelerated adoption of UNFC and UNRMS in direct support thereof.</p>	<p>Invite Member States to organize their resource management functions using UNFC in national capabilities or International Centre of Excellence on Sustainable Resource Management allowing the channelling of existing or new resources for enhanced benefit for Member States and the international community. Seek support of the Working Groups of the Expert Group to develop and monitor plans with short term (1 year) and longer term (5 year) measurable goals.</p>	<p>Support the development and monitoring of implementation plan with short term (1 year) and longer term (5 year) measurable goals.</p>	<p>Identify capabilities if required by Member States and centres to be engaged.</p>	<p>Support Centres, Bureau of the Expert Group on Resource Management and the Secretariat.</p>	<p>Inviting others to resource activities is good and not enough - Bureau of the Expert Group on Resource Management Secretariat will need some 3 full time employees and a budget for travels, consultants, and tools to initiate global UNFC support capacity as described in Point 6.</p>

VIII. Conclusions

74. The Executive Summary outlines the substance of this report. It addresses the need for informed dialogue and decisions for sustainable development. The report proposes eight recommendations for accelerated UNFC adoption to enable such informed dialogue and decisions. And it calls for action.

In conclusion this is:

75. **Why:** Attaining the SDGs demands strong decision support based on science and quantitative resource management information. UNFC has been designed for this. It is unique over other classifications, through its classification of projects, covering environmental, social, economic, and technical conditions, thereby enabling Public-Private Partnerships in resource management. It will make a difference when adopted widely if properly managed.

76. The need for sustainable development, including for mitigating climate change, the securing of sustainable energy and raw material services to a large population coming out of poverty and securing the central mandate of the UN, of peace (facilitated by the advantage of conducting international trade under the rule of law) have been advocated at the highest level and are references.

77. **How:**

- (a) By effectively communicating the purpose and vision of UNFC adoption and how users benefit;
- (b) by extending UNFC to include metrics that projects carry and that users need;
- (c) by respecting the privilege of sovereign states to manage their own resources;
- (d) by recognizing the need for global standards for transnational communication and action of governments, businesses, capital allocators and personnel;
- (e) by securing the required international standards, including the administrative and financial resources at the UN's disposal that are required;
- (f) by securing reliable communication and reporting, including compelling use cases produced by early adopters;
- (g) by allowing monitoring of progress towards achieving the goals of the 2030 Agenda, if necessary, on a project-by-project basis.

78. **By whom:**

- (a) By a digitally-enabled and integrated dynamic Public-Private Partnership between resource governors, businesses, and capital allocators where resource management is performed;
- (b) by the Bureau of the Expert Group on Resource Management governed by UNECE member States in facilitating the implementation of the recommendations of this report.

79. **When:**

Now. The urgency of the 2030 Agenda calls for decisive action, even if the execution of some of the recommendations may initially not be adequately resourced.

Annex I

Report from the themes

1. This Annex contains the extensive and essential reports on the five themes addressed by the UNFC Adoption Group.

A. Resource Governance

2. UNFC is a powerful decision support tool for governments, industry, and others in improving governance and sustainability for resources that are crucial for attaining the Sustainable Development Goals (SDGs), as well as the Paris Agreement. UNFC is an efficient communication tool, carrying important sustainability information for individual projects. It can also aid in visualizing costs, legal/fiscal properties of the clustered potential etc.

3. The adoption of UNFC for resource governance will support the United Nations Resource Management System (UNRMS). The United Nations Resource Management System is a set of principles and requirements that guide the planning, design, operation and closure of resource extraction and processing activities to balance economic development, environmental sustainability, and social responsibility in line with the SDGs and the Paris Agreement. UNRMS is designed to be a global voluntary system for resource management that can be used by governments, industry, investors, and civil society. UNRMS is dynamic, future-facing and supports the incorporation of a circular economy wherever possible.

4. In general, UNFC can support resource governance by:

- Including UNFC in national legislation for regulatory reporting and disclosure obligations.
- Supporting the attainment of the SDGs as relevant to the resource industry. This is done by directing the collective industry towards the shared global goals by visualizing the performance of either individual projects or at an aggregated level, specific raw materials management.
- Optimizing the policy framework, government oversight, industry business process and efficient capital allocation.
- Testing the effectiveness political instruments and resilience against possible future scenarios.
- Facilitating reduction of environmental impacts, pollution, and social risks of natural resource extraction and enhance circularity, by providing a common framework for resource classification.
- Facilitating the harmonization and comparability of resources reporting across different countries and regions.

5. While UNFC can support a wide range of decisions in resource governance, its purpose is not to recommend decisions to be made, but to support the decisions that governments are facing in the governance models they may choose to adopt. In this respect, there is a wide difference between reactive governance, responding to demands from industry and proactive governance seeking to exploit the resources of a country or region in the best way. The latter requires a much more complete set of decisions, more comprehensive decision support and more comprehensive capabilities of the government organization in the form of organizational qualification and capacity. The focus in this report is on the needs of proactive governance. Reactive governance will use a subset of the decision support that proactive governance requires.

6. UNFC is beneficial to governments and states to understand the potential resources their countries carry, and to understand how individual projects can contribute in a quantitative way to national goals related to energy and raw materials resilience (i.e.,

reliability, affordability, sustainability and social acceptance) e.g. reduced greenhouse gas emissions, renewable and other energy supply, critical and strategic raw material supply, including groundwater, use of anthropogenic resources in a circular economy and infrastructure development including underground storage.

7. The information can be used to understand how well a system is working, in terms of permitting for example, which could be beneficial towards governments as well as other stakeholders in the work of developing well-functioning permitting processes and achieving mutual acceptance. In this context the information carried by UNFC can be of great help also in doing due diligence for specific projects. UNFC may be used by governments in shaping the legal, regulatory, and fiscal systems, the public infrastructures both hard and soft that are required for an efficient and benevolent use of natural and anthropogenic resources. It may also be applied in national econometrics, including assessing, and managing the opportunities and risks if any that the activities represent for the government portfolio.

Acceleration measures

8. Every acceleration strategy needs an engine to create reforms. Globally implementing UNFC is a stepwise effort where some regions, and in particular the EU, Africa, Central Asia, Latin America as well as some countries, such as Ukraine and Norway are advanced along this path. Recently established International Centres of Excellence on Sustainable Resource Management (International Centres of Excellence on Sustainable Resource Management) will play a crucial role in moving governments forward.

9. Suggested acceleration steps include communication, education, research and development, training, and the building of a UNECE support capacity. These are common to all themes. In addition, resource governance would benefit from UNFC-supported and informed activities that:

- Provide incentives, guidance, and support for the transition to meet the climate mitigation and other SDGs including reduced emissions, expanded mineral extraction moving from existing practices and standards to UNFC-based ones, supporting SDGs and the UNRMS principles and requirements.
- Guide planning, design, operation and closure of resource extraction and processing activities in an environmentally, socially, economically, sustainable, respecting the need for high health, safety and environmental (HSE) operating standards and physical realities.
- Engage in dialogue and consultation with relevant authorities and bodies to overcome the legal and institutional barriers for harmonization and integration of UNFC and UNRMS with national and regional policies and regulations.
- Incorporate economic, social, environmental, and technical factors (metrics) into the design and implementation of policies and regulations which address and document the ethical and social concerns related to the impacts of resource governance, environmental sustainability, human rights, and social justice.
- Use UNFC and UNRMS as tools for scenario analysis, risk assessment, and contingency planning to manage the political and economic uncertainties that affect the stability and predictability of resource markets and investments.

10. Metrics that can be included when describing a project are discussed in Annex II. They will facilitate:

- Development of common incentives for all to succeed. As an example, when two assets share a common resource, operations may be unitised in a manner where the participation of the parties in the costs and revenues will be affected by the success of the overall project and not by the way it is produced. In oil and gas, unitisation is therefore often negotiated based on quantities initially in place, corrected for differences in quality in the two or more parts of the resource to be produced jointly, and not based on how much will be produced from each part.
- Joint government led research and development with the participation of government, industry academia, research organizations to find solutions to meet the goals sought.

Once solutions have been found and quality assured, its use can be legislated to ensure adoption

- Use of forecasts of future activities as presented by industry and corrected for global or national constraints and public insight not visible to industry, to inform affected sectors of the economy.
- Management of the State’s direct and indirect economic interests in time relative to significant impacts if any that projects have on the government portfolio, including uncertainties and the ability to acquire and exercise options to mitigate the associated risks and capture the opportunities.
- Negotiated and regulated standards as much as possible to facilitate resource governance administration. This applies to the use of resource classification.
- Applying UNFC will facilitate governance for the resources it is designed to handle as well as those it and could be expanded to cover.
- Incentives to develop standard contracts and agreements negotiated jointly between government and industry will facilitate administration in that databases, personal memories etc. will relate only to the standard and not to the many individual documents authored by the many individual teams of negotiators with variable exposure to the issues negotiated.
- Securing a high standard of the civil service and mitigate the tendencies for well trained professionals for the important public tasks to be hired by the private sector as soon as they are ready to work.
- Metrics for nations seeking to develop national capability, technology, and innovation in resource management (technical, economic, environmental, and social aspects) in collaboration with private sector, assessing the selection of license awards also based on such national capability development metrics.

B. Business Management

Introduction

11. Raw materials industries provide capabilities required to reach the SDGs. Those capabilities consist primarily of mastering the technological challenges and maintaining capacity to implement the solutions required under the changing conditions during reform. The capabilities also consist of social aspects such as job creation and community supporting functions, of economic aspects like wages and taxes, but also to humanity as such by producing raw materials that are essential for development and growth. However, the environmental footprint from raw materials production is often raised as a concern, and the path to sustainable production is a pressing interest.

12. The decisions that UNFC can support in this respect varies over a broad range of stakeholders who may be engaged in one or more of the activities shown in Figure I. The stakeholders comprise inter alia:

- States and governments including permit granting and regulatory authorities.
- Private and/or state-owned enterprises.
- Capital allocators.
- The public at large, including special interest groups, academia, and Non-Government Organizations.

13. The focus in this theme is how UNFC plays a role in Business Management. As described below, one key element is to function as a tool for communication and decision support for a public-private partnership, that in turn can be decisive for the business management of projects, assets, and entities (corporations).

14. A selection of typical business decisions is highlighted. The intention is to illustrate the need for metrics that projects carry and that entities need for decision making rather than

a complete list of all decisions that UNFC may support. Many of the metrics are also needed in the other themes addressed in this report. They are therefore not identified in this section but are discussed jointly. Annex II contains a proposal. The intention is to identify only a few key metrics to demonstrate how UNFC may be used in decision support and to function as a framework with the expectation that this will mature with use.

15. Business development decisions are categorized for five groups:

- Decisions to invest in information.
- Decisions to develop.
- Decisions to operate and produce.
- Decisions to decommission and rehabilitate.
- Decisions to merge, acquire or divest assets⁸.

16. Associated with the decisions listed above are decisions taken by others, which may have a decisive influence on the business management decisions. Such external decisions can be inter alia:

- Government maintenance of legal, regulatory, and fiscal framework conditions.
- Permit granting and approvals.
- Public investments in support of the activities.
- Funding.
- Social acceptance.
- Portfolio management decisions of the participants in the public-private partnership, including government portfolio management.

Motivators and de-motivators to apply UNFC for business management.

17. UNFC can fulfil several important functions by providing a transparent, credible, and comparable information to support efficient decisions and to communicate the level of sustainability in business management and industrial operations. This, in turn, can facilitate (motivate) decision-making by authorities as described in the previous section. It could also function as a communication tool to gain social acceptance, or in other words to motivate not only states and authorities but also stakeholders, Non-Governmental Organizations, and civil society to engage in informed debates about raw material projects. An absolute necessity for all external decision-making is that the information provided can be trusted. To this end, the simplification for preparers that one standard represents to inform several stakeholders (management, partners, governments, capital allocators and the public) on multiple project types facilitates focusing on quality and on disclosure rules rather than on a suite of alternative formalities and data structures. This compensates for the de-motivators for corporate preparers of conceived extra costs and additional layers of administration that do not bring any benefits for them nor the business.

Barriers to adoption

18. An observation is that companies are generally not aware of UNFC, its purpose and what it can do for them. Therefore, they are not waiting to learn about, adopt and apply UNFC. Additional barriers for adoption are likely to be several, and can be exemplified as reservation to consider a new tool for decision support given that this activity is well established, unawareness of its existence, ignorance about how to use it, lack of templates and /or digital enablers, lack of receivers of the information, lack of standard metrics that could provide comparable information, lack of trust in the credibility of the information provided in addition to the normal reactions to change of ignoring it, fighting it and if that does not work, use it and benefit from it.

⁸ An asset is here understood as the legal rights to participate in a project.

19. Legal requirements to apply UNFC may generate the required adoption by enough users to make the benefits possible. This will bring down the barriers and have the potential to provide answers and purposes to at least some of the barriers mentioned. Still, the utmost effect and beauty of UNFC is its potential for framing informed decisions and its global applicability. Therefore, legal requirements must be pursued together with incentives and motivators. Moreover, global applicability is unlikely to happen unless the system becomes more well-known and the advantages it brings become clear.

Recommendations

20. Key aspects that would facilitate adoption and usability are:

- **Credibility:** Meaning validation and comparability of the information sharing. This is provided by the requirements to use qualified personnel and apply industry standards quality assurance/quality control in large engineering systems.
- **Transparency:** Link metrics and information in UNFC to existing recognized standards used by the industry. More on this in chapters VIII and IX.
- **Sustainability:** Mapping UNFC's relation to the SDGs. This can be secured through the Public-Private Partnership architecture reflected in Section IV.D.
- **Incentives:** Provide usability and comparability of information. See Section V and VI.
- **Adaptiveness:** In parallel with the requirements that UNFC must function as a system to share and compare information (speak the same language). See Section V.
- **Selling points:** UN based system and its relation to the SDGs, a system to convey information for external decision making that are important/decisive for business management in the pursuit of sustainable global solutions. Companies who apply for licenses to develop and operate resource projects, benefit by using UNFC due to its proposed metrics in social, environmental, and economic terms (including Environment, Social and Governance aspects adapted to local requirements). This information is required by the recipients including the national and local governments for checking the effects on their aspirations and commitments towards National Determined Contributions to the Agenda 2030 and the related SDGs. Thereby they are providing the information supporting a dialog towards a constructive Public-Private Partnership.

C. Capital Allocation

21. This supports the theme of this report of applying UNFC for decision support for the Public-Private Partnership that requires governments industry and finance to act dynamically together to meet the changing challenges of required reforms. Central to change is the societal expectation for capital allocators to support a just energy transition and projects that are aligned with the Agenda 2030 and the SDGs.

22. The resources⁹ sector referred to in UNFC are multi-faceted and capital intensive. Thus, investment decisions need to be informed by carefully analysed data and information based on defined criteria. Financiers/investors play crucial roles in funding resource extraction and its associated infrastructure development. See below some types of financiers and investors in this sector:

(a) **Commercial Banks:** Commercial banks provide project financing to resource companies. This is done through loans or credit facilities to fund exploration, development, and construction of resource projects. They are attracted to these projects because they can generate significant interest income and fees;

(b) **Private Equity Firms:** Private equity firms invest in resource projects for potential high returns. They typically provide equity capital to companies in exchange for

⁹ Minerals, fossil fuels, renewable energy, anthropogenic resources, underground storage etc.

ownership stakes. Private Equity Firms have a preference for projects with strong growth prospects. Some equity funds invest in projects for the short term, i.e. they stay in only for the exploration phase or project development phase, divesting once the risk discount of the project value has been reduced;

(c) **Resource-Focused Funds:** These are specialized investment funds that focus exclusively on the natural resources sector, including mining. They pool capital from various investors to fund exploration and production activities. They prefer mineral resource projects because they can offer diversification and inflation hedging benefits. Also, some more general funds invest in the resource sector. Examples include hedge and pension funds;

(d) **Government Entities:** In some cases, governments set up State owned Enterprises (SoEs) as special purpose vehicles (SPVs) to implement and manage exploration and resource exploitation projects. For oil and gas, the involvement of national oil companies is common. This is done to promote economic development, create jobs, and improve living conditions of their citizenry. Governments also provide finance through the depreciation rules of the fiscal system, which in some instances takes the form of neutral sharing of costs and revenues (cash flow taxes) (Lund, 2014);

(e) **Development Banks:** Multilateral and bilateral development banks, such as the World Bank, African Development Bank, and regional development banks, provide loans or grants for resource infrastructure projects. They often have a focus on sustainable and responsible exploitation practices and general development impact issues;

(f) **Resource Companies:** Established companies may invest in their own projects or joint ventures. They prefer resource projects because they align with their core business and growth strategies. Also, some investors acquire royalty streams. Mergers, acquisitions, and disposals are also common. etc.;

(g) **High-Net-Worth Individuals:** Individual investors, particularly those with a high net worth, may invest directly in resource projects or through private equity funds;

(h) **Environmental, Social, and Governance (ESG) Funds:** Some Environment, Social and Governance -focused investment funds are interested in resource projects that meet strict environmental and social criteria. They aim to promote responsible resource development practices and mitigate negative impacts.

23. Investors and financiers prefer funding resources and its related infrastructure projects for several reasons. These include profit potential, resource security, economic development, sustainability and Environmental, Social, and Governance (ESG) considerations. It is important to note that the preference for funding resource projects can vary among investors and financiers, and their motivations can range from profit-seeking to socioeconomic development and sustainability objectives. Additionally, the risk associated with resource investments, including geological, political, and environmental factors, influences the decision of investors and financiers to participate in such projects. Jointly, they may be able to provide constellations to solve needs for enhanced financing that neither would be able to solve in isolation.

Key Decisions – what key decisions do they take around resource development?

24. The decisions often revolve around various aspects of project planning, execution, and management towards optimizing benefits for all stakeholders involved. Thus, decisions made by financiers should consider not only short-term gains but also long-term economic, social, and environmental impacts to create a win-win situation for all stakeholders involved. Some key decisions are provided as follows:

(a) **Project Selection and Due Diligence:** conduct extensive due diligence to assess project viability. This includes evaluating resource potential, market demand, regulatory and legal frameworks, and environmental and social impacts. Financiers also decide on the structure of their investment, which can include equity investments, loans, royalties, or a combination of these. The choice of structure depends on factors such as risk tolerance, expected returns, the financial health of the project and the impact of the investment on the investor's portfolio, including its opportunities and risks;

(b) **Risk Assessment and Mitigation:** Identifying and managing risks is crucial. Financiers assess geological risks, political stability, legal and regulatory risks, and environmental and social risks. They develop risk mitigation strategies, such as diversification, insurance, contractual safeguards, and contingency plans;

(c) **Environmental and Social Impact Assessment (ESIA) and Environment, Social and Governance Standards:** Projects need to meet comprehensive ESIA and Environment, Social and Governance standards. Financiers may also set specific Environment, Social and Governance criteria that projects must meet to receive funding or maintain ongoing support. The structure of UNFC is designed to help communicate decision support in this respect;

(d) **Community Engagement and Benefit Sharing** frameworks need to be in place. This may include creating jobs, building infrastructure, or providing education and healthcare services;

(e) **Technology and Innovation:** Financiers also require the use of advanced technologies and innovative practices to increase resource extraction efficiency, reduce environmental impacts, and enhance overall project profitability;

(f) **Local Content and Procurement:** Decisions are made regarding the percentage of goods and services that should be sourced locally. This can promote economic development in the host country and build local capacity;

(g) **Infrastructure Development:** In many cases, financiers may invest in or finance infrastructure projects such as roads, ports, and energy facilities to support the resource development project. These decisions can have significant economic and logistical implications;

(h) **Legal and Regulatory Compliance:** Financiers ensure that the project complies with all relevant laws and regulations, both domestically and internationally. They may engage legal experts to advise on compliance matters and engage with the partners of the Public-Private Partnership to help adapt the legal framework to the needs of change in ways that may be financed;

(i) **Market Conditions:** Financiers continuously assess global market conditions, including commodity prices, demand-supply dynamics, and geopolitical factors, which can affect the project's profitability and long-term viability.

Motivators for adoption of UNFC - how can UNFC assist the key decisions?

25. The motivation for financiers to adopt UNFC standards includes risk assessment, investment confidence, international comparability, due diligence, environmental and social considerations, sustainable finance, resource management, and market dynamics. UNFC assists in key investment decisions by providing a standardized framework for resource assessment and reporting, helping financiers assess project viability, risks, and alignment with sustainability goals. This, in turn, supports responsible and informed investment in resource projects. See below:

(a) **Provision of systematic internationally recognised framework for project risk assessment:** The UNFC standards provide a systematic and internationally recognized framework for assessing geological and technical opportunities and risks associated with resource projects. UNFC categorizes resources based on their level of confidence, helping financiers understand the degree of uncertainty involved in a project. Due to the transparency of the standards, financiers have greater confidence in the accuracy and reliability of the resource estimates, among others. Also, in terms of resource management, UNFC assists financiers in evaluating a project's long-term resource management potential. Decisions can be made about whether the project's resource base can sustain production levels over time, and at what costs and impacts, which is crucial for long-term investment strategies;

(b) **International Comparability:** UNFC provides a common language and classification system for resources that is recognized globally. The standards can be used to compare and contrast resource projects across different countries and regions, facilitating investment diversification and risk management;

(c) **Environmental and Social Considerations:** UNFC can assist financiers in evaluating the environmental and social implications of resource projects, as well as compliance with reporting standards. This reduces the risk of legal and reputational issues related to resource reporting discrepancies;

(d) **Sustainable Finance:** As environmental and social considerations become increasingly important in the finance sector, UNFC can align with sustainable finance principles by providing a framework for assessing the environmental and social risks and impacts of resource projects.

Identify and describe barriers to adoption - what are the potential demotivators to adopting UNFC?

26. Barriers and potential demotivators include:

- Cost/perceived cost versus benefit/perceived benefit is a factor. Even more so for companies/stakeholders that are managing cash costs.
- **Legal and Regulatory Compatibility:** UNFC adoption may require aligning with local legal and regulatory frameworks. In regions with specific resource classification requirements, financiers may face legal barriers or complications in adopting UNFC.
- **Resource Price Volatility:** The resource industry often faces volatile commodity prices, which can impact the economic viability of projects. Financiers may be concerned that UNFC' focus on long-term resource assessment may not adequately address these price fluctuations.
- **Resource Governance Issues:** UNFC encourages responsible and sustainable resource governance. However, in regions with weak governance structures or corruption, financiers may be hesitant to adopt UNFC standards, as they could expose governance issues.

27. Overcoming these obstacles may require education, industry collaboration, regulatory alignment, and efforts to demonstrate the benefits of UNFC adoption for responsible resource management and investment decision-making.

Potential Mitigations/Solutions.

28. Mitigating the obstacles to UNFC adoption by financiers requires a concerted effort from various stakeholders, including governments, industry associations, and organizations specializing in resource classification. Some potential mitigations for the obstacles are provided as follows:

- **Legal and Regulatory Alignment:** Actively work with governments and regulatory bodies to align local legal and regulatory frameworks with UNFC standards. This can reduce legal barriers and complexities.
- **Engage Industry Leaders:** Engage industry leaders and influencers to promote the benefits of UNFC adoption. Their support can encourage others to follow suit. Also, offer incentives or recognition to financiers who voluntarily adopt UNFC standards. This can include preferential treatment for projects adhering to UNFC in terms of access to finance or government support.
- **Risk Management Tools:** Develop risk management tools and methodologies that integrate UNFC classifications. This can help financiers assess and mitigate resource and technical risks effectively.

Early adopters – who are they and what can we learn?

- The level of adoption and the specific experiences of financiers may vary based on their geographic location, sector focus, and internal policies. Since the adoption of UNFC by financiers is still evolving, continuous collaboration, education, and sharing of experiences will be essential as more financiers consider integrating UNFC into their resource investment strategies.

- Whilst some countries have adopted the UNFC as the basis for national resource classification, others are yet to get on board. Additionally, the African Union Commission has developed the African Mineral and Energy Resources Classification and Management System (AMREC), which is based on UNFC and UNRMS, as a unifying system for African countries. Case studies are being undertaken in Namibia and Uganda using AMREC. **However, it is yet to be seen how major capital allocators would align to the UNFC system and champion its usage.** The use of additional metrics beyond resource and product volumes, covering the ESG aspects of projects, may well accelerate the adoption of UNFC by capital allocators in support of their making informed decisions to finance resource projects.

D. Cooperation & Integrated Dynamic Capabilities

Theme Description - definition and who they are / what they do

29. The development of resources in ways which achieve the Sustainable Development Goals requires effective Public-Private Partnerships. These will be characterised by cooperation between stakeholders to make mutually beneficial decisions, and will develop the necessary, evolving capabilities.

30. In Public-Private Partnerships, the public side (UN and governments) set policies and operate framework conditions that allow the industry to deploy its best capabilities in ways that can be financed (wholly or partly) in the capital markets. The ultimate goal is integrated solutions. These are the development of the “right” projects through incentives/disincentives/regulations, appropriate infrastructure, aligned efforts in overcoming barriers and developing necessary capabilities. This includes appropriate focusing/funding research & technology development. The capabilities of all parties need to be dynamic as changes will be material. They also need to be integrative in the sense that the parties need to recognise and respect the positions and constraints of the other parties in shaping the partnership. In short, all parties need to develop Integrative Dynamic Capabilities (IDCs) (Garcia, Lessard, & Singh, 2014).

31. Such integrated solutions are the end game. The focus should be on establishing informed dialogue on resource development between government (e.g., regulators and policy makers), industry (e.g., project developers and portfolio managers, researchers), financiers (e.g., banks and equity investors), and the public. Activist groups and academia can, to some extent, act as proxies for the public and so it is important to involve them in the dialogue. Other stakeholders are essential in developing and passing on capabilities: researchers (in academia, government institutions and industry), educators (in academia and professional bodies including experienced leaders), those who set or maintain standards (regulators, International Centres of Excellence on Sustainable Resource Managements, professional bodies). They too must be part of the informed dialogue.

32. As an example, dialogue led to the Norwegian State achieving more money and improved oil and gas recovery, less emissions, and a community of licensees achieving a stable environment with satisfactory returns (Norwegian Petroleum Directorate, 2023) (Åm & Heiberg, 2014) (Lund, 2014). They did not achieve optimization (that is never achieved), but joint improvement because of their relationship.

33. Agreement between opposed parties will never be achieved unless there is some common shared information. The thing that UNFC has to offer is a common basis for shared, credible information.

Examples of decisions

34. The following are examples of decisions where dialogue between stakeholders can give mutual benefit:

- Integrated decisions to develop a net-zero economy: decisions by a national government, industry, financiers, professional bodies, researchers, educators.

- Integrated decisions to maximise the value of resources in a way that furthers the Sustainable Development Goals. This particularly applies to extractive industries where the value at the source must be sufficient to justify the recovery efforts. In addition, the recovery processes are largely irreversible. Efficient recovery will therefore often involve investing early in measures that may not affect production until much later.
- A national government deciding what reporting obligations industry will have and why, and how the data should be reported i.e., what reporting requirements (determined by what information is required in the public domain), what standards should be used.
- Government regulators collecting information on resource related projects (UNFC could allow coherence across renewable and non-renewable project reporting).
- Non-government regulators/governance bodies (such as stock exchanges, exchange commissions) deciding what information needs to be publicly reported on underlying assets including resources (i.e., natural assets).
- A national government looking at strategic resources (e.g., renewable, and non-renewable) and making policy decisions on which resources to encourage investment in.
- A national government deciding whether to permit the development of a particular resource-based project, or what policies to implement, or what infrastructure to develop.
- A company deciding which projects to progress and how to address technical or commercial barriers; or what capabilities to develop, sometimes considering the international options open to them.
- An equity investor looking at which resource related companies or projects to invest in.
- A bank looking at the quality of natural assets upon which a project/business is being developed.
- Capital allocators exploiting joint financial structures. See Section IV.C. and Annex I.C.
- A university or company deciding what research to undertake on technical barriers, and what capabilities to develop; or what education to provide:
 - A commercial buyer deciding whether to enter into a long-term supply contract for a particular resource (or producing company that includes the particular resource/project in its operations).
 - An importing country deciding what commercial treatment (including any border carbon taxes) to apply to a given resource depending on source, how it is refined and transported, etc.
 - An investor or lender deciding on financing a project which in turn depends on the above.
 - The expert's communities decide which classifications or standards they use to evaluate projects based on adoption the standards at the state or business level.
 - A bank looking at the financial efficiency of using natural resources based on which the project/business is developed.

Motivators for adoption of UNFC - how can UNFC assist the key decisions?

35. UNFC is unique in providing:

- A basis for shared information on project metrics and barriers to progression.

- Credibility in addressing public environmental and social concerns towards meeting the SDGs.

36. UNFC is a framework for organizing information on resource related projects. The benefit of using a consistent framework across resources, projects and types of users is that it provides a common basis for evaluating and comparing options and identifying barriers to development. UNFC facilitates dialogue between stakeholders and provides a trigger for this.

37. UNFC, as a classification of projects, has an emphasis not only on technical, economic, and legal aspects (as with other traditional classifications) but on social and environmental issues, together with the UN badge and the link with the SDGs. It can carry quality assured metrics that projects carry, and the users need.

38. Cooperation in the form described above during a period of acceleration in the adoption of UNFC requires significant efforts to overcome barriers. These are addressed in Sections V and VI.

E. Digital Enablement

Theme Description - definition and purpose

39. UNFC adoption at required scale and pace will only be possible through effective application of modern information technology. Harmonization structures / taxonomy, integrative technology and modern patterns of application connectivity will be needed to build the required information system to support the themes described above.

40. UNFC is a framework for organizing information about resource related projects to provide a common and consistent basis for understanding projects and making decisions. The digital enablers required to ensure effective operation of the UNFC are embryonic / emergent but rapidly evolving. Establishing common definitions (taxonomy), standards and enabling technology will be essential enablers of the required information system. Coordinated responses, a focus on information needs of decision makers and investment are needed to put this system in place.

41. Doing so will provide the capability that decision makers require to objectively assess, select, and manage the “right” projects through incentives/disincentives/regulations, align efforts on overcoming barriers (including focusing/funding research & technology development), and developing capabilities and infrastructure.

Key Enablers – the elements of modern digital infrastructure required to operate an information system:

42. Retrieval and analyses of information on projects, assets and entities is rapidly migrating from reports to web crawlers making decisions critically dependent on the digital versions of the information. The underlying digital infrastructure must:

- Support of decentralized operation.
- Ensure intercommunication and exchange of UNFC digital data.
- Provide guidance for end users.
- Support data quality dimensions on both backend and user interface level.
- Provide efficient data storage (use of modern technologies like Time Series Data Base (TSDB)).
- Use environmentally aware technologies and mindset (e.g. Code and performance optimization).

Identify and describe barriers to adoption - current state assessment

- Complexity: this is not easy and existing information systems have typically evolved over a long period and through a process of trial and error (e.g. Financial Accounting & Reporting framework).

- Standards: many standards exist to date, have evolved ‘organically,’ are often doing the same / similar things and more emerge on a frequent basis. A period of convergence is underway with e.g. International Financial Reporting Standards Foundation playing a leading role in industry and regulator led reporting requirements.
 - The Environment, Social and Governance standards are mostly sector agnostic and concentrate on general disclosure of data with no or little coherent specification across individual industries like GRI or SASB. The Environment, Social and Governance scoring systems are not harmonized and these scores are not or hardly comparable. UNFC can provide a quantifiable comparison and view of resource projects and can help to integrate the resource industry in the ESG landscape.
- Technology: the required tech stack does not yet exist; lots of entrants and startups are looking to develop commercial offerings.
- Applications: currently limited offerings and no market standards. Major players (e.g. SAP, Microsoft, SLB, etc.) are developing in-house solutions following traditional architecture patterns (monolithic, not interoperable, etc.).
- Funding: there are limited visible paths to commercial value therefore limited motivation for the tech majors to invest in developing software to meet emergent needs.
- Digital/Data Security: Particularly important for Cloud Solutions - the enabling technology that is asking users to input their data for the purposes of a guided analysis etc. is owned by someone and is based somewhere. This owner and location may be in a different jurisdiction to the government/company that is the user. This transfer of data may cause security concerns to arise in end users. Digitalisation of the process, again particularly on cloud, may also increase risk of cybercrime. Even if there are technical solutions that address this the perceptions of the End Users may be that these solutions do not exist (they are new and there will be a knowledge lag), so the messaging/marketing aspect comes into play.
- Data Diffusion: Unless UNFC is reported from the Operators at the lowest level (initial reporting) – e.g. if they are using a different standard like the Society of Petroleum Engineer’s Petroleum Resources Management System (PRMS) - the higher-level organization such as a government may not have the relevant information from the base reporting to classify properly in UNFC even with a bridging document.
- Limited Scope: Is UNFC wide enough? Could a barrier be that it does not address the interface between resources and other parts of society well enough to meet the needs of decision makers. For example, could the “common data platform” approach be applied equally to, say, infrastructure projects - e.g. What about a government decision - should we invest in High-Speed Railway (HS2) or in a wind farm or in a new highway? Currently UNFC only gives information about the wind farm. The expansion of the UNFC metrics may help meet this need.

Identify and describe potential mitigations

- Establish and enforce data standards, protocols to improve the data availability and quality for resource assessments using UNFC.
- Digital/Data Security: Open-Source Data Universe Forum and ecosystem has technology that can mitigate concerns around data residency or enable and support resident solutions that some jurisdictions require.
- Quality Control (Digital Tools): Industry-recognised digital solutions could be benchmarked against standardized test cases or by independent and accredited bodies to ensure they are trustworthy and compliant?

Early adopters – who are they and what can we learn?

- The Open Group, and particularly the OSDU® Forum provide examples of driving towards digitally enabled enterprise through collaborative development of industry standards, open source & cloud native data platforms. There are many parallels to the digital needs of a widely adopted UNFC - these could be explored with the right leadership, commitment, and investment / resources.
- Others?

UNFC digital taxonomy or data model

- It is necessary to support decentralized data and to ensure exchange of UNFC digital data between independent digital UNFC, GIS or inventory systems.
- Can provide guidance for vendors and through them for end users to support the integrity of UNFC reporting.
- It can help to unify the disclosed data of UNFC reports.

43. It may be worth considering a base/main + differentiator data model with unique or at least pseudorandom identifiers (where duplication is considered close enough to zero to be negligible) where relevant. The differentiator can contain the key user group¹⁰ specific data extended with commodity specific elements defined by sectoral experts.

Digitalised bridging

44. UNFC Data Bridging and mapping to a unified UNFC data repository from existing historical or actual resource inventory is essential to help the adoption of UNFC. The UNFC project maturity and resource progression model provides Sub-categories and Sub-classes for more in-depth evaluation and classification. Bridging the historical or actual inventories to UNFC can significantly increase data resolution. Digitalization and automation following the rules of the official bridging documents can help to convert the existing data repository to UNFC, can provide assurance to high data quality and overcome barriers. This applies to any resource data repository, for governments and regulators at local, national, or regional level, for company portfolios or vendors providing data, or capital allocators reviewing their investment portfolio and investment options.

¹⁰ Government (e.g., regulators and policy makers), industry (e.g., project developers and portfolio managers) and financiers (e.g., banks and equity investors).

Annex II

List of Recommended Initial Metrics

1. It ¹¹ that the Bureau of the Expert Group on Resource Management develops guidelines for the use of metrics that projects carry and that users need in line with its decision at the thirteenth session of the Expert Group on Resource Management³¹². Future looking estimates are associated with uncertainty. To manage the opportunities and risks associated with them requires that the uncertainty in estimates is provided when this is significant for the decisions to be supported. In addition to life cycle quantities of sources and products, the following metrics should be considered among others:

- (a) Physical metrics:
 - (i) Time series and cumulative of sources and of products (as applicable). Needs may differ for different classes and commodities;
 - (ii) Input factors (supplies of energy, water, transport capacities, and supply chain deliveries etc.) through time and cumulatively;
 - (iv) Products consumed in operation in time. Total quantities are already included through UNFC Category E3.1.
- (b) Economic metrics:
 - (i) Investments through time and cumulatively;
 - (ii) Operating costs through time and cumulatively;
 - (iii) Prices in time, including the basis for estimating prices;
 - (iv) Revenues through time and cumulatively;
 - (v) Net present values of cash flows;
 - (vi) Product value at the point of production through time and cumulatively.
- (c) Environmental metrics:
 - (i) Emissions through time and cumulative. Emissions corresponding to Scope 1 and Scope 2 should be prioritised over Scope 3 type emissions;
 - (ii) Water balance (quantity) and water measures through time and cumulatively;
 - (iii) Biodiversity impacts through time and cumulatively.
- (d) Social metrics:
 - (i) Employment through time and cumulatively;
 - (ii) Social consequences (such as displacement of population and impact on indigenous peoples' rights and labour market) through time and cumulatively.
- (e) Guidelines for the conversion of project-based metrics to asset and entity-based metrics.

¹² Facilitating the inclusion of metrics with UNFC does not imply that the metrics shall be disclosed. Unless legislation requires disclosure, it is up to the owner of the information to choose what to disclose and to whom.

Annex III

Accounting and decision testing

1. Application of the United Nations Framework Classification for Resources is auditable. Some help in this regard is to expose the change in a project class or its metrics from one period to the next. This is particularly powerful where forecasts may be compared with actuals. Figure III indicates how changes may be tracked using input-output tables, a technique also employed in national econometric analyses (UN DESA Statistical Division, 2018) and the Design Structure Matrix Method (Eppinger & Browning, 2012) for project management. The matrix may be adapted to show the effects of research investigating changes in project conditions.

Figure III
Simplified matrix designed to show the changes in classification and in project metrics*

		Closing balance								Revision	
		Sold or used	Produced and not used	E1F1	E1F2	E2F1	E2F2	E3F1	E3F2	E3F3	E3F4
	Sales production			Not applicable							
	Non-sales production			Not applicable							
Opening balance	E1F1										
	E1F2										
	E2F1										
	E2F2										
	E3F1										
	E3F2										
	E3F3										
	E3F4										

↑ Downgrades
→ Upgrades

* See: <https://unece.org/sites/default/files/2021-02/ECE-ENERGY-GE3-2021-8%20UNFC%20Commercial%20Intro%20Guidance%20final.pdf>

Annex IV

United Nations Framework Classification for Resources Survey

- Stakeholder Survey about the Barriers and Drivers for the Adoption of UNFC for Sustainable Resources Management. Improvement of Cooperation between Relevant Stakeholders.
- A total of thirty-seven experts were asked to answer a series of questions. Eighteen responded and the responses, which largely confirm the statements made in this report, are summarized below.

Section 1: Information about the interviewed person was anonymised and not reported. A selection of UNFC adopters and non-adopters related to the three themes were interviewed.

Section 2: Needs and Barriers

2.1 What specific needs or objectives do you or your organization have that could be addressed through the adoption of UNFC?

The adoption of UNFC can effectively address specific needs and objectives within their context, particularly in using it as a communication tool to classify and describe projects. However, challenges may arise due to unclear occurrences, complicating the classification and description process.

In this sphere, there are distinct needs related to sustainable resource management. They aim to manage and map resources comprehensively, aligning with their commitment to support a transition toward environmental sustainability and comply with relevant legislation and directives. UNFC can play a pivotal role in achieving these objectives by providing a standardized framework for resource classification.

The standardization offered by UNFC is of utmost importance for them, as it facilitates the integration of social and environmental aspects into their resource management practices. This ensures that their projects adhere to internationally recognized standards, promoting transparency and accountability. By adopting UNFC, they can enhance their ability to communicate effectively, classify projects consistently, and meet their organizational objectives of sustainable resource management, comprehensive resource mapping, and support for transitions in line with relevant regulations.

2.2 Can you identify any barriers or challenges that have prevented you or your organization from fully embracing UNFC? Please explain.

While the adoption of UNFC has encountered no significant barriers in Africa, elsewhere, several challenges impede full embracement. Administrative burdens associated with implementation, the perception that benefits diffuse over time, concerns about the validity of information derived, and the variation in jurisdictional requirements pose obstacles. Navigating these challenges requires tailored strategies to streamline administrative processes and ensure consistent implementation across diverse contexts.

Section 3: Cooperation and Collaboration

3.1 What are the main factors or reasons that hinder cooperation between different stakeholder groups in implementing UNFC?

The cooperation between different stakeholder groups in implementing UNFC faces several key challenges:

Firstly, the lack of training among stakeholders hampers effective collaboration, as a common understanding of UNFC principles may be lacking. Secondly, divided ownership of information arises, with differing views on who has priority in interpreting provided data, leading to potential conflicts in implementation. Varying interests, purposes, and goals among stakeholders also contribute to cooperation challenges, making it difficult to find

common ground and work collectively toward the objectives of UNFC. Additionally, the absence of a mandatory obligation to implement UNFC e.g. water-related aspects diminishes the incentive for stakeholders to actively engage in compliance efforts. Lastly, a critical factor is the lack of trust among stakeholders, hindering information-sharing and coordinated efforts. Addressing these challenges requires concerted efforts to provide training, establish shared ownership structures, align interests and goals, build trust, and explore avenues for creating stronger commitments to UNFC implementation in water-related projects.

3.2 What strategies or initiatives do you believe would be effective in increasing cooperation and collaboration among stakeholders for the successful implementation of UNFC from your perspective?

To enhance cooperation and collaboration among stakeholders for the successful implementation of UNFC, several strategic initiatives are recommended:

Firstly, a focus on **capacity-building** is crucial. Conducting training sessions and workshops will empower stakeholders with the knowledge and skills needed to actively participate in the UNFC classification and assessment process, addressing challenges related to inertia and ignorance.

Secondly, there is a need for a concerted effort to disseminate information regarding the **benefits of UNFC**. Raising awareness about the positive impacts and advantages of UNFC implementation will help overcome resistance and encourage stakeholders to see its value in resource management and project communication.

Thirdly, the establishment of organized standards is essential. The adoption of templates such as the Committee for Mineral Reserves International Reporting Standards (CRIRSCO).

The CRIRSCO Template and adherence to CRIRSCO Standards can provide common denominators and uniform levels of information corresponding to classification numbers. This structured approach facilitates collaboration by ensuring consistency in data presentation.

Addressing challenges associated with inertia involves proactive efforts to showcase the **tangible benefits of UNFC implementation**. Success stories and case studies can serve as compelling examples, motivating stakeholders to actively engage in the classification process.

Tackling **ignorance** necessitates targeted educational campaigns. Webinars, publications, and outreach programmes can dispel misconceptions and provide accurate information about UNFC, contributing to a better-informed stakeholder community.

To address the **fear of data sharing**, establishing clear guidelines and protocols for data confidentiality and security is essential. Building trust through transparent communication about data protection measures can encourage stakeholders to share information more freely, fostering a collaborative and open environment.

Section 4: Incentives and Drivers

(a) For Investors:

4.1. What factors or information are most important to you when considering investments in resource projects?

For investors, several factors and information play a pivotal role in the decision-making process when considering investments in resource projects. One critical aspect is ensuring that the advantages of adopting the UNFC (United Nations Framework Classification for Resources) over other resource classification systems are clearly communicated to all stakeholders.

Understanding the **advantages of UNFC** is paramount. This includes recognizing the framework's ability to provide a standardized and internationally recognized classification system. The transparency and consistency offered by UNFC enable investors to make informed decisions, as it ensures a common language for assessing and comparing resource

projects. The framework's emphasis on integrating social and environmental aspects into resource management is also crucial, aligning investments with sustainable practices.

Additionally, investors prioritize access to comprehensive and accurate data on resource projects. This includes detailed geological information, estimates of resource quantities and qualities, and assessments of project viability. Clarity on the regulatory landscape and adherence to international standards, such as UNFC, provide assurance to investors regarding the reliability of the information presented.

Moreover, factors such as the political and economic stability of the region, legal frameworks, and compliance with environmental and social responsibilities are integral considerations. Investors often seek projects with clear risk mitigation strategies and a commitment to ethical and sustainable practices, as these elements contribute to the long-term success and resilience of the investment.

(b) For Governments:

4.2 What challenges do you face in managing and regulating resource projects within your jurisdiction?

Need for Increased Stakeholder Involvement: Governments face the challenge of incorporating a broader range of stakeholders in the management and regulation of resource projects. This became evident during continental workshops in Africa, where it was apparent that many major stakeholder groups were still in the learning phase regarding UNFC. Expanding engagement with stakeholders is crucial for effective resource project governance, requiring efforts to educate and involve diverse groups in the implementation of standardized frameworks like UNFC.

Coordination Among Different Authorities: Another challenge is the presence of different authorities working on resource projects, often undertaking disparate activities. This lack of coordination can lead to inefficiencies, redundancies, and conflicting regulations. Governments need to establish mechanisms that foster collaboration among these authorities to ensure a cohesive and streamlined approach to managing and regulating resource projects within their jurisdiction. This includes developing frameworks that promote information sharing, harmonization of procedures, and a unified regulatory strategy.

4.3 How do you perceive the potential benefits of adopting UNFC in your country?

One key advantage lies in the establishment of a **comparable and standardized classification system** for mineral resources. This introduces a new level of transparency to the global mining sector, enabling clear and consistent communication across countries. Standardization not only streamlines international collaboration but also enhances the credibility and reliability of shared information within the global mining community.

Furthermore, the inclusion of aspects such as **social acceptance, environmental protection, and spatial planning** into the classification process represents a critical benefit. The UNFC inclusive framework allows countries to move beyond traditional metrics and consider broader factors, aligning with the growing emphasis on responsible and sustainable resource management. This integration ensures that mineral exploration and extraction are conducted with due consideration for social and environmental impacts on a global scale.

4.4 What types of support or resources would be helpful for implementing UNFC at a national level?

Effective Engagements and Capacity-Building: Robust support through effective engagements and capacity-building initiatives is crucial. Providing training programs, workshops, and collaborative forums can enhance the understanding and proficiency of stakeholders involved in the implementation process. This support helps build the necessary skills and knowledge required for consistent and accurate application of UNFC principles.

Direct Communication with UNECE-UNFC Agency: Establishing direct communication channels between the UNECE-UNFC Agency and relevant Ministries is essential. This direct line of communication facilitates a clear understanding of UNFC guidelines and ensures that national authorities receive timely updates and guidance. It enables a more streamlined and efficient adoption of UNFC principles in the national context.

Establishment of Special Joint Working Groups: Creating special joint working groups dedicated to the implementation of UNFC within the reporting system on mineral resources and reserves is a proactive step. These working groups can bring together experts from various relevant sectors, fostering collaboration and ensuring a coordinated approach to integrate UNFC into the national reporting framework. This collaborative effort helps align practices, address challenges, and ensure the effective implementation of UNFC.

(c) **For Industry Representatives:**

4.5 Do you see any challenges in adopting UNFC within your organization or sector? If so, please specify.

Comparability: One major challenge lies in achieving comparability across projects. Differing legal requirements and variations in the capacity to provide background investigations, reports, and analyses may undermine the actual comparability between different projects. There is a constant risk that the numerical data generated using UNFC may not convey the same meaning across projects due to these disparities.

Credibility: Maintaining credibility poses another significant challenge. In instances where stakeholders oppose a project, there is a pervasive risk that the quality and motivation behind the information provided using UNFC will be questioned. Overcoming scepticism and ensuring that the information is perceived as credible are critical aspects that demand attention for the successful adoption of UNFC.

Usability: If comparability and credibility are compromised, the overall usability of UNFC comes into question. Stakeholders may question the motivation for using UNFC if there are shortcomings in these fundamental aspects. Motivating the continued use of UNFC in such circumstances becomes a key challenge, as stakeholders may be reluctant to rely on a system that does not guarantee consistent comparability and credibility across projects.

4.6 What incentives or benefits do you believe UNFC could bring to your industry?

In adopting UNFC within our organization or sector, one perceives several potential challenges despite recognizing the obvious benefits. **The primary advantage lies in having a UN-based tool for information sharing on resources, providing a unified system for resource classification. This has the potential to enable the comparison of different projects.** However, challenges may arise in implementing the UNFC, including potential hurdles in aligning existing organizational practices with the framework. This could involve adjustments to information-sharing protocols and classification systems. Additionally, ensuring universal adherence across diverse projects and sectors within the organization might pose coordination challenges. Addressing these potential hurdles will be crucial to fully realize the benefits of the UNFC in facilitating information sharing and standardizing resource classification within our organization or sector."

Section 5: Recommendations

1. Based on your insights and experience, what specific recommendations would you make to improve the overall cooperation and alignment among stakeholders in the context of UNFC adoption?

Continuation and Enhancement of Working Groups: Given the successful coordination of an 18-member Working Group of UNFC experts across Africa since 2016, it is recommended to continue and enhance these collaborative efforts. The Working Group has demonstrated effectiveness in developing key documents such as African Minerals & Energy Resources Classification and Management System and the Pan African Resource Reporting Code. Consider expanding and diversifying the Working Group to include representatives from various sectors to ensure a comprehensive approach.

Knowledge Sharing on UNFC and Groundwater Perspective: Promote extensive knowledge sharing on UNFC, emphasizing its role in supporting groundwater resource management, green energy transition, and achieving Sustainable Development Goals (SDGs). Given the vulnerability of groundwater to competing uses, highlight how UNFC can safeguard both groundwater quantity and quality. This educational initiative should target stakeholders across sectors to foster a shared understanding of UNFC benefits.

Incorporate Groundwater Perspective in Implementation: Recognize the significance of groundwater from the perspective of resource extraction and mining. Incorporate guidelines within the UNFC implementation framework to ensure sustainable use of groundwater, especially in activities such as mining for coal, minerals, and geothermal energy. Emphasize the importance of managing groundwater resources responsibly to prevent adverse impacts on both quantity and quality.

Legal Framework and Letters of Intent: Advocate for the adoption of appropriate legal acts to formalize the implementation of UNFC. Work towards establishing working groups focused on specific examples, fields, or projects to mutually develop and refine the application of the UNFC system. Encourage stakeholders to express commitment through Letters of Intent, signifying their dedication to aligning practices with UNFC and its principles.

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