COP 31: Mitigation and adaptation measures implemented by small countries: strategies to reconcile climate action and sustainable economic growth

تدابير التكيف والتخفيف التي تنفذها الدول الصغيرة: استراتيجيات للتوفيق بين العمل المناخي والنمو الاقتصادي المستدام.

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Abstract

Small States are actively participating in regional efforts to develop climate change mitigation and adaptation measures and achieve climate goals, while striving to maintain a sustainable balance between production and consumption. They are deploying innovative strategies to reconcile resilience, ecological transition, and the sustainability of their limited resources. This translates into integrating sustainable development and climate action into the core of their national visions and strategic plans, setting ambitious targets, and launching a wide range of innovative measures, including the transition to renewable energy, improving energy efficiency, implementing the blue economy, adopting nature-based solutions, promoting local innovation, and encouraging smart green projects that contribute to climate change mitigation and adaptation. In the context of climate action in the Eastern Mediterranean and in preparation for the 2026 United Nations Climate Change Conference (COP31), national and academic institutions in Lebanon, in cooperation with the UNESCO Regional Office and relevant ministries, are organizing seminars and conferences. These events will bring together leading academics, activists, and climate and environmental policy experts from around the world to discuss ways to achieve climate goals and explore innovative policy alternatives to enhance efforts through regional scientific cooperation to mitigate and adapt to climate change. A focus will be placed on the leading role that small states in the region can play in these efforts. The seminars, details of which will be announced soon, will host academics and activists specializing in climate issues to exchange ideas on the challenges and solutions related to climate change.

Keywords: COP31, energy efficiency, energy transition, mitigation measures: climate action, decarbonization, carbon pricing, sustainable economic growth, small countries.

ملخص: تعمل الدول الصغيرة من خلال المشاركة في االجهود الإقليمية في تطوير تدابير التخفيف والتكيّف مع تغيّر المناخ وتحقيق الأهداف المناخية في ظلّ سعيها للمحافظة على توازن مستدام في الإنتاج والاستهلاك. ويترجم هذا من خلال وضع التنمية المستدامة والعمل المناخي في صلب رؤاها الوطنية وخططها الإستراتيجية، محدّدة بذلك أهدافاً طموحة ومُطلقةً مجموعة واسعة من التدابير المبتكرة من خلال التحول إلى مصادر الطاقة المتجددة وتحسين كفاءة استخدام الطاقة، وتطبيق "الاقتصاد الأزرق"، وتبني الحلول القائمة على الطبيعة بالإضافة الى الابتكار المحلي وتشجيع المشاريع الخضراء الذكية محلياً والذي لها دور في التخفيف والتكيف مع تغيّر المناخ. وفي إطار تعزيز التعاون العلمي الإقليمي في شرق المتوسط واستعداداً لمؤتمر الأمم المتّحدة لتغيّر المناخ لعام 2026 (COP31)، تنظّم المؤسسات الوطنية والأكاديمية في لبنان بالتعاون مع مكتب اليونسكو الإقليمي والوزارات ، ندوات ومؤتمرات تجمع نخبة من الأكاديميين النشطاء المتمرسين في قضايا المناخ والمهتمين بالسياسات البيئية في العالم لاستعراض كيفية تحقيق الأهداف، واستكشاف بدائل سياسية مبتكرة لتعزيز جهود التخفيف من تداعيات التغيّر المناخي والتكيّف معها، مع التركيز على الدور الريادي الذي يمكن ان تؤديه الدول الصغيرة في المنطقة في قيادة هذه المساعي. وتستضيف الندوات التي ستحدد قريبا عدد من الأكاديميين والنشطاءالمتمرسين في قضايا المناخ، لتبادل الرؤى حول الخطط الاستراتيجية والتحدّيات والحلول المناخية.



I - Introduction: The 31st Conference of the Parties (COP31) marks a turning point in global climate cooperation. It aims to achieve emissions reductions at the speed and scale required to meet climate goals, while simultaneously preserving prosperity, jobs, and social cohesion. Limiting greenhouse gas emissions to a level that keeps global warming below 2°C by 2100 is important everywhere

on the planet, for both developing and developed countries. To project these changes, two well-known mathematical models used in economics and environmental science break down and analyze the factors that influence the global carbon footprint. These models are based on an equation that expresses emissions as the product of population, gross domestic product (GDP) per capita, and carbon intensity—that is, carbon emissions per unit of GDP. Furthermore, both approaches highlight that an increase in population or global wealth can be offset by technological advances distinct from carbon intensity.

On the other hand, economic activity generates greenhouse gas emissions for production, construction, and transportation; however, the carbon intensity of the activity, or emission factor—that is, the amount of emissions per unit produced—can vary considerably depending on numerous technical and geographical factors. The assessment of these emissions relies on a Life Cycle Assessment (LCA).

The main variables influencing these emissions include:

• The energy mix: Using renewable energy sources (solar, wind) or a low-carbon electricity grid drastically reduces emissions compared to coal-based production.

• The manufacturing process: The level of technological efficiency, the degree of automation, and energy-saving practices all affect the amount of resources consumed to achieve the same output.

• The nature of the inputs: Using recycled or bio-based raw materials lowers the initial carbon footprint compared to extracting virgin or fossil fuels.

• Yield and logistics: Low scrap rates, a short supply chain, and low-impact modes of transport (such as rail or maritime freight) significantly reduce the impact per unit.

• Life cycle management: The integration of circular economy approaches (repair, reuse) and end-of-life waste treatment methods plays a major role.

While a decoupling between territorial emissions and economic activity has been observed in several countries in recent years, achieving climate objectives will require a faster and more massive reduction in emissions and therefore, to preserve growth, an amplification of this decoupling, including for imported emissions.

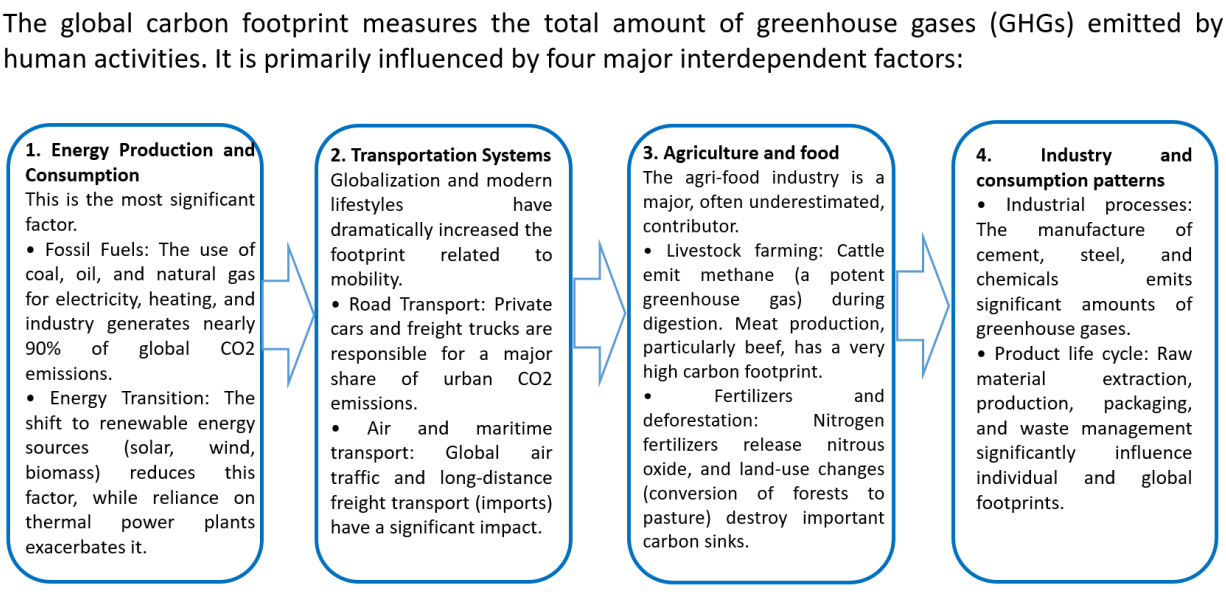


Figure 1: Global carbon footprint: Four major interdependent factors

II. A) - The COP31 contribution of small countries in Middle east

COP31, to be held from November 9 to 20, 2026, in Antalya, Turkey, marks a strategic turning point. Faced with international tensions, the summit seeks to bridge the gap between the commitments made at COP30 in Belém, Brazil, and concrete action on

the ground, refocusing climate efforts on security and economic independence. Here are the main pillars of strengthening climate action:

(a) Geopolitics and Energy Security: (i) Sovereignty and independence: Recent geopolitical crises have demonstrated that dependence on fossil fuels is a source of insecurity. The transition to renewable energy is now seen as a cornerstone of national and industrial security. (ii) Innovative governance: COP31 is distinguished by an unprecedented shared leadership model: Turkey is the official host country, while Australia chairs the negotiations. This alliance aims to unify sometimes divided blocs and accelerate consensus-building.

(b) Priorities and Challenges: (i) From Commitment to Implementation: The focus is no longer on new promises, but on the concrete implementation of Nationally Determined Contributions (NDCs) and the transformation of heavy industry. (ii) Climate Finance: Operationalize the financial mobilization target set at previous summits to meet the needs of developing countries, which are particularly vulnerable to shocks. (iii) Emergency and Human Rights: Strengthen the integration of human rights and social justice into the ecological transition.

Greenhouse gas mitigation balances climate action with economic growth through. These efforts aim to decouple economic development from emissions, ensuring sustainable growth while preventing the most severe impacts of climate change. Key approaches include:

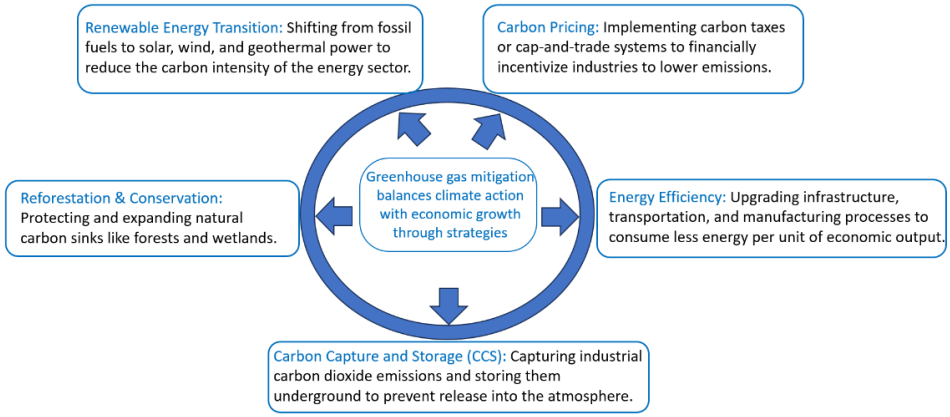


Figure 2: Efforts to decouple economic development from emissions and ensure sustainable growth: key drivers of decoupling

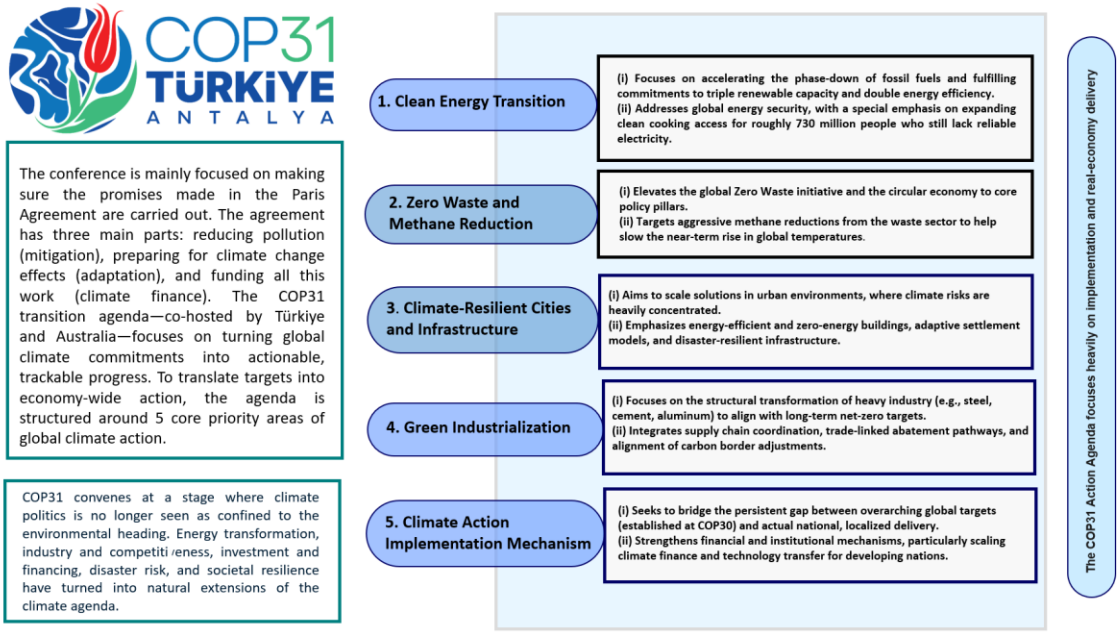


Figure 3: The COP31 transition agenda is built on five main pillars aimed at translating global climate targets into measurable, economy-wide action.

II. B) - The COP31 contribution of small countries in Middle East : Lebanon case

Lebanon established a Long-Term Low Emission Development Strategy (LT-LEDS) to decouple its emissions from economic growth. This strategy emphasizes job creation and poverty reduction through investments in renewable energy, reforestation, and climate-smart agriculture. But the devastating escalation and occupation in March 2026 caused severe ecological and public health crises in Lebanon. The environmental impacts can be summarized in these three key areas:

(i) Toxic Particulates and Smoke: Airstrikes and bombardments generate immense clouds of smoke, dust, and toxic compounds (e.g., dioxins and hydrocarbons), degrading air quality not just in the South and Bekaa, but also in urban centers like Beirut.

(ii) Incendiary Munitions: The continued deployment of white phosphorus and other incendiary weapons has ignited massive "scorched earth" fires, destroying over 5,000 hectares of forest cover and 2,154 hectares of orchards since the conflict began.

(iii) Soil Contamination: Munitions and chemical defoliants have left heavy metal and elevated phosphorus residues in agricultural soils, while everyday pollutants like unmanaged rubble and the heavy reliance on diesel generators further degrade the local environment.

Small Middle Eastern countries (such as Lebanon) can contribute to COP31 by focusing on regional climate adaptation, piloting decentralized renewable energy initiatives, and aligning with the summit's dual Presidency model. They serve as vital bridges to amplify the voices of highly vulnerable populations in global climate negotiations.

III A)- Small Countries of the Middle East: Regional Adaptation to Climate Change

Small countries of the Middle East can contribute to COP31 by focusing on regional adaptation to climate change, leading decentralized renewable energy initiatives, and adhering to the summit's dual presidency model. They are essential intermediaries for amplifying the voices of the most vulnerable populations during international climate negotiations. The Middle East region (Lebanon, Palestine, Jordan, Yemen), which is warming at twice the global average, is experiencing severe water stress, accelerated desertification, and conflicts that are destroying its adaptation infrastructure. For the small countries in this region, adaptation has become an existential imperative, requiring highly specific sectoral strategies tailored to their economic capacities and geopolitical situations.

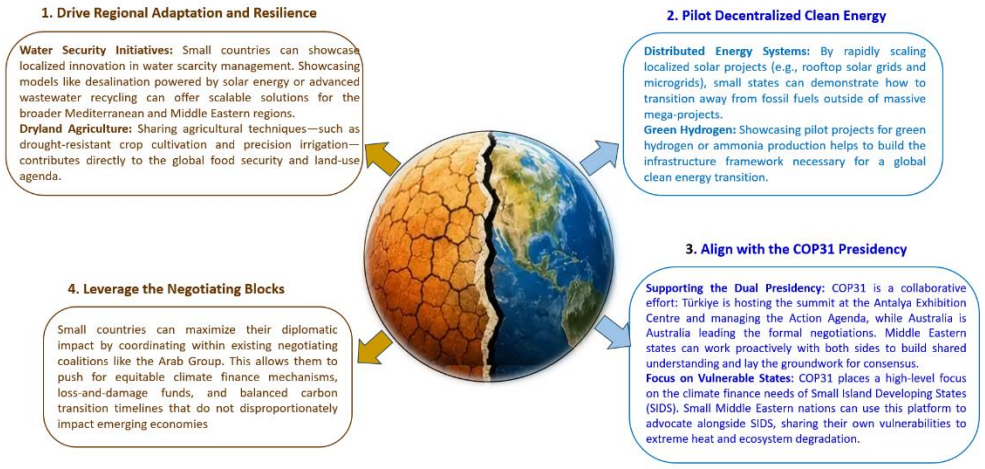


Figure 4: Efforts to support the Global Adaptation Goal (GAP) and the promotion of local National Adaptation Plans (NAPs) aim to transform climate action from theory into concrete and adaptable results at the regional level.

III B) - The Pillars of Regional Adaptation

The pillars of regional adaptation refer to the strategic framework used to build long-term resilience against environmental, social, or demographic shifts.

(i) **Combating Water Scarcity:** Optimizing drinking water networks and using treated wastewater for agriculture have become the norm for conserving this resource.

(ii) **Energy Transition as a Lever for Adaptation:** To reduce vulnerability related to desalination (which requires significant amounts of fossil fuels), many countries are investing heavily in solar energy, transforming this transition into a strategy for economic survival.
(iii) **Cross-Border Cooperation:** Faced with declining flows in the Tigris, Euphrates, and other river basins, improved joint management of international waterways and groundwater is essential to prevent rural exodus.

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