AUS DEN NATIONALEN BERICHTEN ÜBER DIE ENERGIEVERSORGUNGSPOLITIK DER HOCHSCHULEN – EIN WEG ZU EINEM AKTIONSPLAN

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Dokumenteninformation	
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EINFÜHRUNG

Ziel und methodischer Ansatz zur Entwicklung einer Roadmap.

Der Hauptansatz zur Entwicklung der Roadmap basiert auf einer Übersicht über Strategien, Politiken und Maßnahmen, die die Expertise und institutionellen Praktiken im Bereich Nachhaltigkeit und Energie der ABCinENERGY-Projektpartner abbildet. Diese Übersicht zielt darauf ab, das Zusammenspiel zwischen nationalen Kontexten und den institutionellen Initiativen der Projektpartner darzustellen, sowie Maßnahmen, Instrumente und Optionen hervorzuheben, die Hochschulen (HEIs) anwenden können, um Nachhaltigkeitsziele umzusetzen – mit besonderem Fokus auf Energieressourcen unter Berücksichtigung des jeweiligen nationalen Kontextes.

Dieser Bericht bietet Einblicke in institutionelle Rahmenbedingungen und Energiesparpraktiken an HEIs in Österreich (Universität Graz), Frankreich (Université de Montpellier), Italien (Universität Palermo), Litauen (Vilnius Gediminas Technical University – VILNIUS TECH), Serbien (Universität Novi Sad) und Spanien (Universität Alicante).

Die nationalen Berichte (siehe Anhänge 1–6) bilden die Grundlage zur Identifikation von Mustern im Energieeinsparverhalten und in institutionellen Praktiken. Sie dienen als Ausgangspunkt für die Entwicklung eines gemeinsamen strategischen Ansatzes zwischen HEIs. Aufbauend auf diesen Erkenntnissen skizziert die nachfolgende Methodologie die sequenziellen Schritte zur Erstellung einer einheitlichen, evidenzbasierten Roadmap zur Integration von Nachhaltigkeits- und Energie-KPIs in HEIs, im Einklang mit nationalen Energie- und Klimazielen. Der Prozess umfasst **vier Hauptschritte**:

1. NATIONALER UND INSTITUTIONELLER POLITISCHER KONTEXT
2. IDENTIFIKATION VON BEST PRACTICES UND HERAUSFORDERUNGEN
3. BEWERTUNG VORHANDENDER ENERGIE-KPIS UND DATEN
4. ENTWICKLUNG DER ROADMAP DES KONSORTIUMS

Die ersten drei Schritte wurden durch eigens entwickelte, einheitliche Vorlagen zur Datenerhebung unterstützt:

i. Vorlage für nationale Berichte zu Nachhaltigkeits- und Energiestrategien, insbesondere solchen, die die Politik des Ressourcenmanagements an HEIs beeinflussen.
ii. Vorlage zur Identifikation von Best Practices und Herausforderungen im Bereich Monitoring und nachhaltiger Nutzung von Energieressourcen.
iii. Vorlage zur Identifikation bestehender Daten zu Energie-KPIs.

Methodik und Aufbau der Berichte Die nationalen Berichte wurden zwischen Oktober 2024 und Mai 2025 erhoben. Die Methoden zur Datensammlung umfassten die Analyse von Rechtsdokumenten, die Auswertung von Primär- und Sekundärdaten, Umfragen, Expertenbewertungen sowie bei Bedarf Tiefeninterviews oder Fokusgruppen. Die Partner hatten

die Freiheit, die jeweils geeignetsten Methoden auszuwählen, um die Ziele der Umfrage zu erreichen. Verweise und Hyperlinks zu den analysierten Dokumenten im Text sowie ein Literaturverzeichnis am Ende jedes Berichts waren verpflichtend, um die Validität der Ergebnisse sicherzustellen und ggf. Zugriff auf Primärquellen zu ermöglichen.

Schritt 1. NATIONALER AND INSTITUTIONELLER POLITISCHER KONTEXT

Die Vorlage (i.) für nationale Berichte zu Nachhaltigkeits- und Energiestrategien, die insbesondere das Ressourcenmanagement an HEIs beeinflussen, bestand aus offenen Fragen und einem strukturierten Multiple-Choice-Abschnitt. Der Aufbau des Berichts ermöglicht eine Analyse, die sich vom Makrobereich (nationaler Kontext) zu den institutionellen Ebenen fortsetzt und im Abschluss mögliche Synergien zwischen nationalen und institutionellen Praktiken bei den Partner-HEIs beschreibt. Die Berichtsvorlage bestand aus drei Teilen:

- *Das Zusammenspiel der nationalen und institutionellen Strategien:* Die Ergebnisse der nationalen Berichte bieten einen Überblick über die nationalen Strategien und Politiken in den Bereichen Energie und Nachhaltigkeit – mit Fokus auf Ziele, Richtlinien, Zeitrahmen, Maßnahmen und potenzielle Auswirkungen auf den öffentlichen Sektor und insbesondere die Hochschulbildung.
- *Die Übersicht aktueller HEI-Strategien und -Politiken* bietet zentrale Universitätsdaten (z. B. Studierenden- und Mitarbeitendenzahlen, Campusgröße, Infrastrukturzustand) und skizziert die Visionen der jeweiligen Universität im Bereich Nachhaltigkeit (z. B. Umstellung auf einen klimaneutralen Campus, Green Campus, andere langfristige Projektionen). Jeder nationale Bericht enthält eine Übersicht der aktuell genutzten Strategien, Politiken und Regularien der Universität (speziell zum Thema Energie oder integriert im weiteren Kontext), welche das Verhalten von Studierenden und Mitarbeitenden steuern und zur Steigerung des Bewusstseins und zur Verhaltensänderung beitragen können.
  Ein besonderes Augenmerk wurde auf das Engagement der Universitätsgemeinschaft (Studierende und Mitarbeitende) bei Energiesparmaßnahmen gelegt. Ziel ist zu identifizieren, wie die Verantwortlichkeiten für die Umsetzung verteilt sind, wer die Hauptakteure bei der Strategie- und Richtliniensetzung, beim Monitoring, der Evaluation, Berichterstattung und Kommunikation sind, sowie wie Beteiligung und Engagement der Community sichergestellt werden. Die Daten wurden hierbei strukturiert erhoben, insbesondere mittels einer 5-Punkte-Likert-Skala zur Bewertung der Rolle verschiedener Zielgruppen. Dieser Abschnitt wurde **„Institutionelles Engagement für Maßnahmen“** genannt.
- *Wechselwirkungen von Strategien und Politiken: Hierarchien:* Hier wird die Beziehung zwischen nationalen und HEI-Strategien erklärt - wie nationale Strategien in umsetzbare Initiativen auf HEI-Ebene umgesetzt werden und wie institutionelle Politiken mit den nationalen Strategien übereinstimmen oder davon abweichen. Außerdem wird der Grad der institutionellen Autonomie und Flexibilität bei der Setzung energiebezogener Ziele und KPIs bewertet sowie die institutionelle Bereitschaft, bei der Umsetzung über gesetzliche Rahmen hinaus Leadership zu übernehmen. In diesem Abschnitt werden auch universitätsspezifische, innovative Praktiken identifiziert. Die Best Practices wurden zur Fallanalyse gesammelt, um potenziell institutionenspezifische Maßnahmen, die sich durch hohe Beteiligung und Motivation auszeichnen, zu identifizieren.

Aufgrund der Vorgaben zur Berichtslänge wurden der erste und letzte Teil zusammengeführt. Dies ermöglicht eine kohärente Analyse des Zusammenspiels zwischen nationalen und institutionellen Strategien und deren praktischer Umsetzung an den HEIs unter Beibehaltung eines logischen Flusses von der Makropolitik zu institutionellen Maßnahmen und Initiativen.

Schritt 2. IDENTIFIKATION VON BEST PRACTICES UND HERAUSFORDERUNGEN

Die Vorlage (2) zur Identifikation von Best Practices und Herausforderungen im Bereich Monitoring und nachhaltiger Energienutzung zielte darauf ab, erfahrungsbasierte Lösungen im verantwortungsvollen Umgang mit Energieressourcen an HEIs herauszuarbeiten. Die gesammelten Fälle (siehe Anhang 7) dienen einer zweifachen Nutzung: als Grundlage zum Verständnis der Vielfalt potenzieller Aktivitäten zur Unterstützung institutioneller Strategien und als Blaupause für Partneruniversitäten zur Entwicklung eigener Aktivitäten. Im Mittelpunkt standen Lern-, Verhaltensänderungs- und Engagement-Kampagnen. Für die Transferfähigkeit geben alle Fälle Kontext (Bedarfe, Ausgangssituation), Ziel der Maßnahme, Hauptakteure, deren Rollen und erzielte Ergebnisse an. Erfolgsfaktoren (insbesondere im Hinblick auf Motivationsinstrumente) und Schlüsselbedingungen für die Übertragbarkeit werden erläutert.

Hauptkriterium für die Auswahl der 2-3 Fälle pro Partner war deren Übertragbarkeit auf andere Universitäten und die Schaffung eines nachhaltigen Impacts, einer Lösung oder Maßnahme. Insgesamt wurden 10 Fälle mit einer detaillierten Beschreibung der Umsetzung gesammelt. Erkenntnisse zur Überwindung möglicher Barrieren (strukturell, finanziell, technologisch oder politisch, sozio-kulturell, gewohnheitsbedingt) wurden für die nächsten Phasen des ABCinENERGY-Projekts dokumentiert.

Schritt 3. BEWERTUNG VORHANDENER ENERGIE-KPIs UND DATEN

Die nationalen Berichte wurden durch die Vorlage (3) zur Identifikation bestehender Energie-KPI-Daten ergänzt. Ziel war die Erfassung der vorhandenen Daten zu Energie-KPIs, welche für das Monitoring und die Beurteilung der Energieergebnisse an den Partner-HEIs verwendet werden. Dies beinhaltete das Sammeln von KPIs, die die Einrichtungen bereits verfolgen (Energieverbrauch, -erzeugung, Effizienz, erneuerbare Energien etc.), deren Messgrößen (relativ und absolut) sowie die Bewertung der Verfügbarkeit aktueller Datenquellen und die Identifikation von Lücken bzw. nicht erhobener Indikatoren. Diese Ergebnisse bilden die Grundlage für die Roadmap.

Zusammenfassend bilden die Ergebnisse der drei aufeinander abgestimmten Umfragen pro Partner (nationale Berichte, Best-Practice-Identifikation (Fallanalyse) und KPI-Umfrage) und deren aggregierte Resultate die Hauptprämisse für den Aufbau einer gültigen Grundlage zur Entwicklung der ABCinENERGY Roadmap.

Schritt 4. ENTWICKLUND DER ROADMAP DES KONSORTIUMS

Auf Grundlage der Ergebnisse der vorangegangenen drei Stufen wird der Aktionsplan des Konsortiums durch Zusammenfassung und den Vergleich von nationalen und institutionellen Strategien, der Identifikation von Best Practices sowie aktuellen Herausforderungen und der Bewertung vorhandener und potenziell identifizierbarer KPI-Daten entwickelt. Die Leitlinien definieren phasenweise Umsetzungsmaßnahmen, Verantwortlichkeiten und Monitoring-Mechanismen, um Hochschulen die Integration von Nachhaltigkeit und Energieeffizienz-Praktiken im gesamten Konsortium zu erleichtern.

1. NATIONALER UND INSTITUTIONELLER POLITISCHER KONTEXT

1.1 DAS ZUSAMMENSPIEL VON NATIONALEN UND INSTITUTIONELLEN STRATEGIEN. VERFLECHTUNG VON STRATEGIEN UND POLITIKEN: HIERARCHIEN.

Analyse von sechs nationalen Berichten – jeder bietet einen Überblick über den Einfluss nationaler Politik (Strategien, Politiken, Imperative) auf HEIs durch die Perspektive der ABCinENERGY-Partner: Universität Graz (Uni Graz) – Österreich, Université de Montpellier (UM) – Frankreich, Universität Palermo (UNIPA) – Italien, Vilnius Gediminas Technical University (VILNIUS TECH) – Litauen, Universität Novi Sad (UNS) – Serbien, Universität Alicante (UA) – Spanien. Der nationale Politikkontext gepaart mit einer repräsentativen Falluniversität erlaubte (1) die Analyse, wie sich die Entwicklung von Energie- und Nachhaltigkeitsstrategien auf institutioneller (HEI) Ebene mit der nationalen Politikutwicklung deckt, und (2) welche Modelle des Zusammenspiels zwischen nationaler Politik und Universitätsstrategie sich aus den vorgelegten institutionellen Praktiken ergeben.

Die Entwicklung der Roadmap erforderte die Identifikation des gemeinsamen europäischen Kontexts hinsichtlich energetischer Nachhaltigkeit, der alle Partneruniversitäten betrifft und den Rahmen für eine einheitliche strategische Richtung bestimmt. Weiterhin lag ein Fokus auf dem Analysegrad der rechtlich bindenden Anforderungen, um zu verstehen, wie stark die nationalen Imperative ausgeprägt sind und wie viele verbindliche Vorgaben im Energiesparbereich in institutionelle Strategien und Entscheidungen übernommen werden müssen. Die Hauptfrage lautete, wie umfassend diese Imperative im Bereich der Energieressourcennutzung tatsächlich sind.

Die Voraussetzung für das gemeinsame „Blueprint for Action“ ist: Alle sechs Länder (Österreich, Frankreich, Italien, Litauen, Serbien und Spanien) folgen dem Europäischen Green Deal und der 2030 Agenda und streben bis 2050 Klimaneutralität an. Die Hauptthemen – und damit strategische Richtung auf europäischer und nationaler Ebene – umfassen Energieeffizienz, erneuerbare Energien, Klimaresilienz und unterstreichen die Bedeutung von Stakeholder-Engagement über das gesamte Spektrum nationaler Strategien hinweg. HEIs werden konsequent als Triebkräfte für Bildung, Forschung, Innovation und Öffentlichkeitsarbeit in diesen Übergängen anerkannt, wodurch die Erwartung entsteht, Universitäten als "Orchestratoren des Wissens" in ihren Ökosystemen und als führende Akteure zu sehen, die Lösungen für die Beschleunigung der grünen Transformation initiieren und bereitstellen können. Trotz der allgemeinen Übereinstimmung mit den gesamteuropäischen Zielen für 2030 bestimmen die Besonderheiten der nationalen Stärken, Herausforderungen, Energiestruktur, Nutzungsgewohnheiten und das Profil der Industrie spezifische nationale Herausforderungen, die wiederum durch verschiedene Instrumente in den Bereich der Hochschulen übertragen werden. Betrachtet man die nationalen Verpflichtungen zur Nachhaltigkeits- und Energiepolitik für HEIs, sind drei Alternativen ersichtlich: Starke Ausrichtung auf nationale Politiken durch regulatorische Maßnahmen; Verpflichtung durch Teilregelungen; freiwillige Verpflichtung in einem Umfeld "ohne regulatorischen Druck" (siehe Tabelle 1).

Tabelle 1. Alternative nationale Kontext-Szenarien für die Regulierung der energiebezogenen institutionellen Verpflichtung.

Land	Gesetzlich bindend für HEIs?	Art der verbindlichen Verpflichtung	Durchsetzung / Strafen
Österreich	Ja	Universitätsleistungsvereinbarungen mit Klimaneutralität bis 2035 und Zwischenzielen bis 2030	Haushaltskürzungen oder Korrekturmaßnahmen, wenn Hochschulen die Bedingungen des Leistungsabkommens nicht erfüllen
Frankreich	Ja	Das Dekret zur Tertiärbildung schreibt bis 2030 eine Reduzierung des Energieverbrauchs um 40 % vor; der „Plan Vert“ ist für Hochschulen gesetzlich vorgeschrieben	Verwaltungsstrafen bei Nichtbefolgung (bis zu 7.500 €/Gebäude)
Spanien	Teilweise	Hochschulen befolgen die allgemeinen Energierechtsvorschriften des öffentlichen Sektors (z. B. Energieaudits, 10%-Reduzierung, große Institutionen haben besondere Verpflichtungen)	Allgemeine Verwaltungsgelder, die in der Regel auf Hochschulebene nicht durchgesetzt werden
Italien	Nein	Hochschulen werden durch den PNRR und Strategiedokumente gefördert, aber gesetzlich nicht verpflichtet.	Keine angegeben
Litauen	Nein	Freiwillige Klimaneutralitätsverpflichtung (gemeinsame Erklärung der Konferenz der Rektoren litauischer Universitäten)	Keine rechtliche Durchsetzung; nur Peer- und Förderer-Rechenschaftspflicht
Serbien	Nein	Das nationale Gesetz zum Klimawandel verpflichtet Hochschulen nicht zur Einhaltung.	Keine spezifischen Strafen für Hochschulen

Die von Partnern bereitgestellte Kontextanalyse veranschaulicht den Rahmen für nationales Engagement. Die nationalen Klimaziele **Österreichs** (klimaneutral bis 2040, Zwischenziele 2030)

werden ausdrücklich auf Universitäten ausgeweitet und sind durch ein Klimaneutralitätsmandat (2040) vorgesehen. Der Bundesuniversitätsentwicklungsplan (GUEP) verlangt von allen öffentlichen Universitäten, dass sie bis 2035 klimaneutrale Campus erreichen. Leistungsvereinbarungen (Leistungsvereinbarungen, §13 Universitätsgesetz 2002) verpflichten jede öffentliche Universität, eine dreijährige Leistungsvereinbarung zu unterzeichnen, die Nachhaltigkeitsziele enthält (z. B. verpflichtende Treibhausgasinventare, Energieaudits und Klimafahrpläne), mit Indikatoren für die Reduzierung von Emissionen und Energieverbrauch. Dies sind rechtsverbindliche öffentlich-rechtliche Verträge, die strategische Verpflichtungen definieren. Jede der 22 öffentlichen Universitäten schließt diese Leistungsvereinbarungen mit dem Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF) ab. Typische Verpflichtungen für Universitäten umfassen die Erstellung jährlicher Treibhausgasbilanzen, die Veröffentlichung eines Fahrplans zur Klimaneutralität des Campus und die Integration von Nachhaltigkeitsthemen nicht nur in den Betrieb, sondern auch in die Lehrpläne, gemäß der GUEP-Richtlinie. Die Leistungsvereinbarungen beinhalten Durchsetzungsmaßnahmen: Wenn vereinbarte Ziele verfehlt werden, erlaubt der Vertrag dem Ministerium, Korrekturmaßnahmen zu verlangen oder Kürzungen der Mittel vorzunehmen.

Der Plan Vert in **Frankreich** verlangt von jeder Hochschule, einen Green Campus Plan zu erstellen, der seit 2009 die ökologischen Dimensionen der Campuspolitik abdeckt. Universitäten müssen Programme für nachhaltige Entwicklung (Governance, Campusmanagement, Lehrpläne) umsetzen und können Labels wie DD&RS (Nachhaltigkeit) anstreben. Die Regeln des Energiespardekrets gelten direkt für Universitäten: Es schreibt vor, dass alle tertiären Gebäude (einschließlich Universitäten) den Endenergieverbrauch bis 2030 um ≥ 40 % (im Vergleich zu 2010), bis 2040 um 50 % und bis 2050 um 60 % reduzieren. Das Dekret legt Berichtspflichten über den Energieverbrauch fest (über die Plattform OPERAT) und verlangt von jedem Campus die Erstellung eines Maßnahmenplans. Unter dem oben genannten Dekret überwachen die Präfekturbehörden die Einhaltung. Anhaltende Nichteinhaltung kann zu Verwaltungsgeldern führen. Die Grenelle-Anforderung ist nicht mit spezifischen Strafen verbunden, aber Universitäten riskieren Reputationsschäden und den Verlust der Förderfähigkeit für grüne Mittel, wenn sie das Plan Vert-Mandat ignorieren.

Obwohl es nach den nationalen Klima- und Energiegesetzen **Spaniens** (z. B. Gesetz 7/2021 über Klimawandel, Nationaler Energie- und Klimaplan) keine speziellen Vorgaben für Hochschulen gibt, die allgemeine Dekarbonisierungsziele festlegen, aber keine hochschulspezifischen Verpflichtungen auferlegen, werden Universitäten wie andere öffentliche Einrichtungen behandelt und müssen die allgemeinen Energievorschriften des öffentlichen Sektors einhalten. Große öffentliche Einrichtungen (einschließlich der meisten Universitäten) unterliegen den Anforderungen an Energieaudits gemäß dem Königlichen Dekret 56/2016 (Umsetzung der EU-Energieeffizienzrichtlinie). Sie fallen auch unter das Königliche Dekret 1422/2021 (Energieausweise für Gebäude) und profitieren von Fördermitteln aus dem Wiederaufbauplan für Energieaufwertungen auf dem Campus. Die Energiesparmaßnahmen der Regierung 2022/2023 (z. B. RDL 14/2022, das die Nutzung von Klimaanlagen in öffentlichen Gebäuden reduziert und Heiz-/Kühlgrenzen vorschreibt) gelten für Universitätsgelände als Teil des staatlichen Sektors. Ein Verstoß einer Universität würde über die üblichen Verwaltungsmechanismen behandelt. Zum Beispiel kann die Nichterfüllung verpflichtender Energieaudits oder die Nichteinhaltung des staatlichen 10%-Einsparplans zu Prüfungen durch lokale oder regionale Behörden führen. Ähnlich wie in Frankreich erlauben spanische Vorschriften jährliche Bußgelder von bis zu 7.500 €

für die Nichtmeldung von Energieplänen. In der Praxis sind Durchsetzungsmaßnahmen jedoch äußerst selten.

Italien hat ehrgeizige Klima- und Energieziele (Kohlenstoffneutralität bis 2050 gesetzlich verankert, EU-konforme NECP-Ziele für 2030), aber es gibt keine Gesetze, die speziell Pflichten für Universitäten festlegen. Hochschulen unterliegen umfassenden Vorgaben des öffentlichen Sektors und nationalen Strategien (z. B. dem Nationalen Energie- und Klimaplan und dem neuen Nationalen Transformationsplan) zur Emissionsreduzierung und Energieeffizienzsteigerung. Italienische Universitäten müssen allgemeine Vorschriften einhalten: So müssen beispielsweise öffentliche Gebäude Mindestanforderungen an die Energieeffizienz erfüllen (Nahezu-Null-Energie-Gebäudestandards), und öffentliche Verwaltungen sollten ihren Verbrauch um 3 % pro Jahr reduzieren, obwohl viele dieser Regeln noch umgesetzt werden. Das Dekret über umweltfreundliche öffentliche Beschaffung stellt sicher, dass öffentliche Institutionen, einschließlich Universitäten, umweltfreundliche Produkte und Dienstleistungen in ihren Abläufen bevorzugen. Das Gesetz für nachhaltige Mobilität fördert Elektrofahrzeuge und umweltfreundlichen Verkehr und ermutigt Hochschulen, auf nachhaltige Transportsysteme umzusteigen und Forschung zu städtischen Mobilitätslösungen zu betreiben. Es ist zu beachten, dass der PNRR (Recovery-Plan) und ministerielle Richtlinien Universitäten dazu anregen, Nachhaltigkeitsstrategien zu planen, dies jedoch hauptsächlich als Anreize oder Zuschüsse (nicht als Verpflichtungen) geschieht. Es gibt kein spezifisches Durchsetzungsregime für Hochschulen, obwohl das Versäumnis, vorgeschriebene Energieaudits durchzuführen oder auf Effizienzstandards zu renovieren, nach allgemeinem Recht zu Verwaltungsstrafen oder reduzierter öffentlicher Finanzierung führen könnte. Als proaktive Maßnahme haben einige Universitäten freiwillig eigene Ziele gesetzt (z. B. über das RUS-Nachhaltigkeitsnetzwerk).

Litauen hat keine universitätsspezifischen Gesetze zur Nachhaltigkeit, die Verpflichtungen für Universitäten festlegen; jedoch legt das litauische Gesetz zur Bewältigung des Klimawandels (2017) und sein Klimaplan für 2030 wirtschaftsweite Ziele fest (z. B. ~30 % Reduktion der Treibhausgasemissionen im Vergleich zu 2005, 45 % erneuerbare Energien), die auch auf Hochschulen als Akteure des öffentlichen Sektors ausgeweitet werden, ohne den Hochschulen strikte Pflichten zuzuweisen. Von öffentlichen Institutionen wird allgemein erwartet, dass sie die Effizienz verbessern (durch das Regierungsprogramm und EU-abgeleitete Vorschriften), einschließlich der Universitäten als staatlich finanzierte Einrichtungen. Litauische Universitäten unterliegen den üblichen Energievorschriften (Bauvorschriften, Effizienzförderungen), aber es gibt keine zusätzlichen gesetzlichen Instrumente, die speziell auf Hochschulen abzielen. Renovierungs- und energiebezogene Initiativen werden durch den Nationalen Wiederaufbauplan als Anreize gefördert, nicht als Verpflichtungen. Es gibt keine speziellen Durchsetzungsmechanismen für Universitäten. Grundsätzlich könnte die Nichterfüllung nationaler Anforderungen an Energie- oder Klimaberichterstattung nach dem Verwaltungsrecht sanktioniert werden. Die Durchsetzung konzentriert sich jedoch auf industrielle Emittenten; die Nichteinhaltung durch Universitäten (z. B. das Nicht-Einreichen von Energieberichten) würde wahrscheinlich zunächst nur zu Verwaltungshinweisen führen. Im Jahr 2020 haben jedoch alle großen Universitäten (über die Rektorenkonferenz – LURK) freiwillig ein Klimawandelabkommen unterzeichnet. Im Rahmen dieses Pakts verpflichtet sich jede Universität, jährlich über Fortschritte zu berichten (einschließlich Treibhausgasemissionen, Energieverbrauch, Maßnahmen zur Klimaresilienz) und alle fünf Jahre einen campusbezogenen Klimaschutzplan zu aktualisieren. Dies ist eine gemeinsam erklärte Kooperationsverpflichtung, keine gesetzliche Pflicht.

Das Gesetz **Serbiens** über den Klimawandel (2021) etabliert ein System zur Überwachung, Berichterstattung und Überprüfung (MRV) und verpflichtet Serbien, die Treibhausgasemissionen bis 2030 um 9,8 % gegenüber 1990 zu senken. Dieses Gesetz deckt alle Sektoren ab, enthält jedoch keine spezifischen Bestimmungen für Universitäten. Es gibt auch ein Ziel der Neutralität bis 2050 und eine Strategie für kohlenstoffarme Entwicklung (2023), die mit den EU-Zielen übereinstimmt. Da serbische Universitäten wie öffentliche Einrichtungen behandelt werden, müssen sie die nationalen Energie- und Umweltvorschriften einhalten (z. B. Genehmigungen für hoch emittierende Anlagen, Anforderungen an die Energieeffizienz von öffentlichen Gebäuden). Nach dem Energiesetz Serbiens müssen große öffentliche Gebäude beispielsweise ihre Isolierung verbessern und möglicherweise Energiemanager ernennen. Dies sind jedoch allgemeine Regelungen, keine spezifischen Vorschriften für Hochschulen. Das Energiewirtschaftsgesetz (geändert im Jahr 2021) und das Planungsgesetz (das das Klima in die Planung einbezieht) legen allgemein Nachhaltigkeitsanforderungen für öffentliche Behörden fest. Das Gesetz über den Klimawandel selbst sieht Bußgelder für das Überschreiten von Emissionsgrenzwerten vor, aber Universitäten sind in der Regel keine bedeutenden Emittenten von regulierten Treibhausgasen (außer möglicherweise für Heizkessel auf dem Campus). Wenn eine Universität die vorgeschriebene Energieauditierung nicht durchführen oder Bauvorschriften missachten würde, würde sie dieselben Sanktionen wie jede öffentliche Einrichtung erwarten (z. B. Arbeitsstopps, Bußgelder nach Bau- oder Umweltrecht). Für Hochschulen gibt es keinen speziellen Strafmechanismus. Die offizielle Strategie für kohlenstoffarme Entwicklung fordert alle Sektoren auf, Pläne zur Emissionsreduzierung zu erstellen, aber in der Praxis muss jede Institution (einschließlich Universitäten) intern entscheiden, wie sie diese weit gefassten Ziele umsetzt. Es muss erwähnt werden, dass Universitäten in der Regel freiwillig an staatlichen Programmen teilnehmen und energie- und ressourcenbezogene Ziele in ihre strategischen Entwicklungspläne integrieren (z. B. Anträge auf Fördermittel für Energieeffizienz stellen).

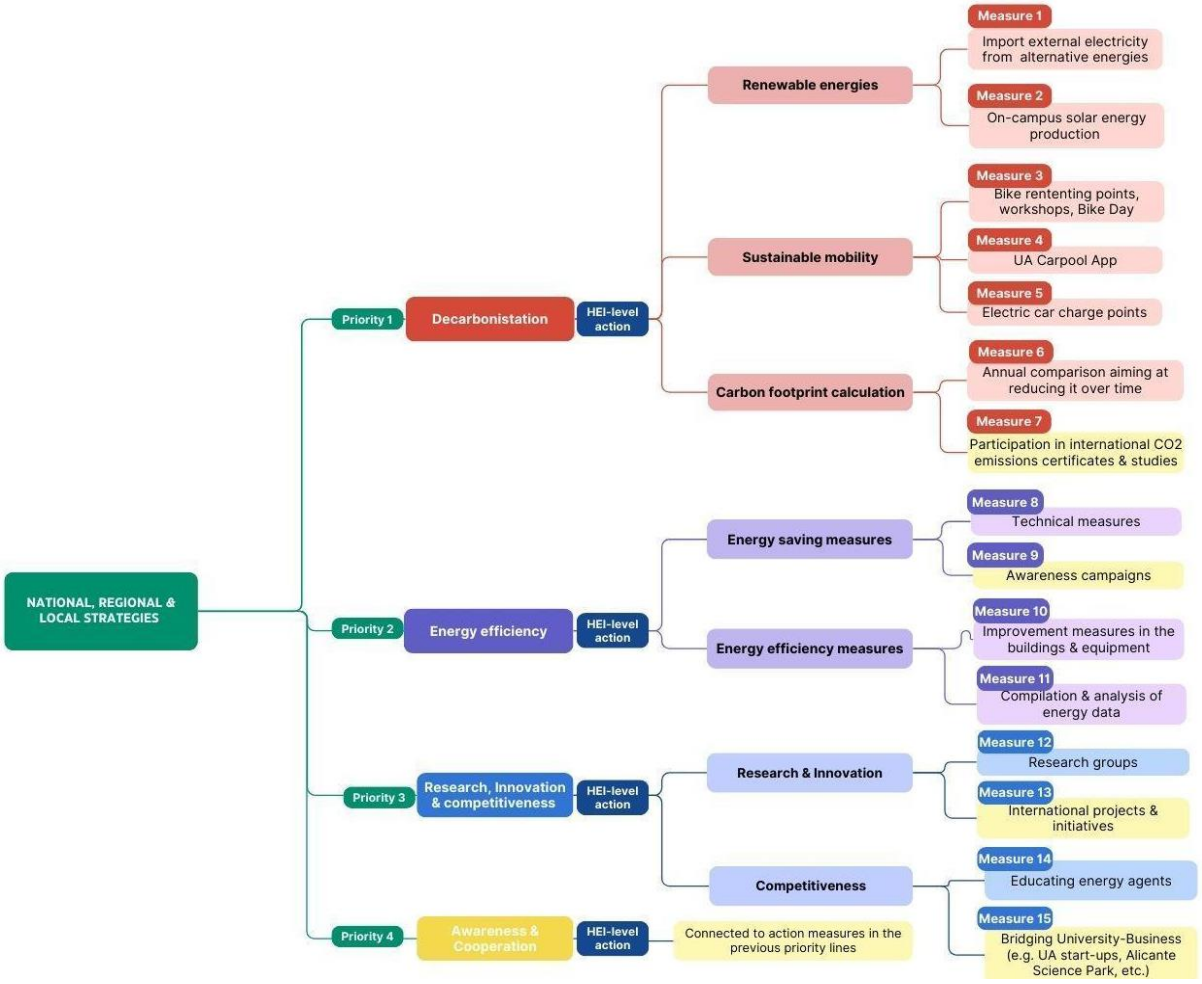

Abbildung 1. Das Zusammenspiel der nationalen Prioritäten und der institutionellen Reaktionen durch Handlungsrichtlinien und Maßnahmen (Quelle: Universität Alicante (Eigene Ausarbeitung aus dem nationalen Bericht), 2025).

Nicht nur das Ausmaß des regulatorischen Drucks, sondern auch einige Aspekte und die Vielfalt der nationalen Politiken können skizziert werden. Zum Beispiel betont Frankreich einen ganzheitlichen, zentralisierten, langfristigen staatlichen Planungsansatz (France Nation Verte) für einen Green Deal, bei dem Universitäten als Einrichtungen des öffentlichen Sektors einbezogen werden. Als Beispiel für eine mittelfristige spezialisierte Strategie zielt der Regeneration School Plan in Italien darauf ab, Universitäten und Schulen in „Nachhaltigkeitslaboratorien“ zu verwandeln und Umweltbildung in Schul- und Universitätscurricula zu integrieren. Unter Berücksichtigung der an Universitäten zugewiesenen Aufgaben wird erwartet, dass sie breit in die Umsetzung nationaler Strategien eingebunden werden. Das von der Universität Alicante bereitgestellte Beispiel veranschaulicht das Modell der komplexen Integration nationaler Strategien in Handlungsrichtungen und Maßnahmen auf Universitätsebene (Abbildung 1).

Diese sechs Hochschulen in den sechs Ländern zeigen ein Spektrum an Governance-Einfluss – von rechtlich verbindlichen Leistungsvereinbarungen bis hin zu freiwilligen, projektbasierten Abstimmungen – sowie verschiedene institutionelle Ansätze, die durch Finanzierung, nationalen

Politikrahmen und Stakeholder-Strukturen geprägt sind. Diese vergleichende Perspektive zeigt, dass, obwohl alle Universitäten darauf abzielen, zu nationalen Energie- und Nachhaltigkeitszielen beizutragen, ihre Strategien in der Durchsetzungskraft und der Breite des potenziellen Engagements divergieren, was eine Kombination aus rechtlich verbindlichen und freiwilligen Zielsetzungen widerspiegelt. Dies demonstriert sowohl institutionelle Solidarität mit gesellschaftlichen Entwicklungen als auch eine proaktive Haltung und Führungsqualität, die aus der Mission der Universitäten und ihrer Rolle im Ökosystem hervorgeht.

1.2 CURRENT HEI STRATEGIES AND POLICIES OVERVIEW

The six participating universities represent a diverse range of institutional sizes and infrastructure layouts across Europe, offering a comprehensive snapshot of HEIs. The universities vary in size from around 9,000 students (VILNIUS TECH) to approximately 50,000 students (University of Novi Sad). The core group of partners hosts between 26,000 to 35,000 students. These partners reflect the diversity of campus management models, including multicampus structures such as the University of Montpellier, which operates across 10 campuses in various municipalities, and the University of Alicante, with facilities in numerous regional locations; and campuses ranging from modern infrastructure to heritage buildings, as seen at the University of Graz, University of Palermo, and University of Novi Sad.

As mentioned earlier, the sustainability policy in the **University of Graz** is deeply embedded in Austria's national climate commitments, particularly the goal of achieving climate neutrality by 2040. As stated in the national report, this objective is legally binding through institutional performance agreements signed with the Federal Ministry of Education, Science and Research. These agreements mandate the university to set measurable targets, including conducting annual greenhouse gas (GHG) inventories, publishing a climate-neutrality roadmap, and integrating sustainability into operations and teaching. The rationale behind this policy framework is to ensure that the university acts as a role model in driving the national transition toward a low-carbon economy. The university's energy profile includes electricity from the grid, district heating, and a growing proportion of on-site renewable generation, particularly solar PV. The infrastructure is mixed, comprising historic buildings—some dating back to the 19th century—and newly renovated or energy-retrofitted structures, making energy efficiency and renewables a priority. The University of Graz is proactively expanding solar energy capacity, with several photovoltaic systems already operational and plans to increase installations further. Additionally, the institution is committed to reducing building energy use intensity through technical upgrades and behavioural change campaigns.

The University of Graz has developed a comprehensive sustainability framework, reflected in several strategic documents and systems:

- Development Plan 2025–2030, outlining the strategic vision where sustainability is a central pillar.
- Environmental Policy 2024, defining the university's long-term commitment to preserving the environment through research, teaching, and operations (National Report Austria, section 2.3).
- Annual Environmental Statements, offering transparency through performance reports and environmental targets.

- Since 2016, the EMAS Environmental Management System (Eco-Management and Audit Scheme) has structured the university's sustainability governance. EMAS is supported by the Rectorate and implemented by internal teams focusing on environmental risks, compliance, and improvement.

The university's leadership in environmental responsibility is reinforced by interdisciplinary, campus-wide learning initiatives such as staff engagement in ESD certification for university lecturers, which collectively support the integration of a sustainability-focused academic culture.

The **University of Montpellier** aligns its energy strategy with the French national framework, particularly the Tertiary Decree and Plan Vert mandates. The rationale for its energy policy is driven by legal requirements to develop institutional energy action plans and integrate sustainability into governance. With units located across Montpellier, Nîmes, Béziers, Sète, Mende, Perpignan, and Carcassonne, the university serves over 50,000 students, 5,000 staff, and manages 210 buildings (500,000 m^2) and 100 hectares of undeveloped land. Its estate features a mix of historic buildings, 1960s–70s constructions (largely inefficient), and modern structures.

The university's energy use relies heavily on grid electricity and natural gas, with a gradual integration of solar PV systems. Energy retrofitting efforts include improved insulation, LED lighting, and HVAC upgrades.

Montpellier's sustainability management is framed by the Plan Vert, DD&RS label (for societal responsibility), and the Master Plan for Ecological Transition (2023), which outlines GHG diagnostics and targeted reductions. The Energy Conservation Plan, embedded in the SDTE (Sustainable Development and Ecological Transition Strategy), details concrete measures for energy efficiency and waste reduction.

The university's 2023–2025 Contract of Objectives, Means, and Performance (COMP) identifies ecological transition as a strategic priority. Across policy documents, decarbonisation, waste reduction, and biodiversity preservation are key objectives. Sustainability is also embedded in governance, curriculum, research, and community engagement, ensuring Montpellier's position as a national leader in campus sustainability transformation.

Notably, research structures occupy a quarter of the institution's space, highlighting its strong research presence. The real estate portfolio is diverse, featuring very old buildings, constructions from the 1960s and 1970s (mostly ageing and energy-inefficient), as well as new buildings. With buildings of varying ages, the university's energy consumption relies heavily on grid electricity and natural gas. Retrofitting for efficiency has been a key institutional response, with improvements in insulation, lighting, and HVAC systems. Solar PV integration has begun on select rooftops, though it currently remains in a pilot phase.

Montpellier's sustainability management is structured through the Plan Vert, which includes provisions for environmental governance, education, and operations. The university is also pursuing the DD&RS (Développement Durable & Responsabilité Sociétale) label for structured and audited sustainability commitment. As a priority of the University of Montpellier's 2021–2026 multi-year contract, the ecological transition is also a key focus of the 2023–2025 Contract of Objectives, Means, and Performance (COMP). The main documents setting the framework of sustainability management are the Master Plan for Ecological Transition and the Energy Conservation Plan. The Master Plan for Ecological Transition, adopted in 2023, aims to reduce the

university's energy consumption and its contribution to global warming. It includes a comprehensive diagnosis of greenhouse gas emissions across the university. The Energy Conservation Plan is part of the SDTE and focuses on reducing energy usage through various measures, such as improving energy efficiency in buildings and promoting sustainable practices. The decarbonisation of activities, reducing and managing waste, and protecting and promoting diversity are among the specific priorities of the university. Incorporating sustainability into governance structures, curricula, research, and community engagement is the priority integrated across the policy documents.

This legally anchored and systematically governed strategy ensures that the University of Montpellier is committed and proactive in implementing energy and sustainability measures across its campus.

The **University of Palermo (UNIPA)**, founded in 1806, is a leading Italian public institution in Sicily, serving around 40,000 students, with a growing share of international students, currently representing 6% of the student body.

The rationale behind the University of Palermo's energy policies is primarily driven by a commitment to environmental responsibility, financial efficiency, regulatory compliance, and academic leadership in sustainability. The Centre for Sustainability and Ecological Transition (CSTE) plays a pivotal role in advancing environmental policies, fostering research in sustainability, and promoting eco-friendly practices across all university sites. In 2022, the Centre for Sustainability and Ecological Transition (CSTE) was established to coordinate the activities of the University of Palermo aimed at achieving the 17 Sustainable Development Goals (SDGs). CSTE plays a pivotal role in advancing environmental policies, fostering research in sustainability, and promoting eco-friendly practices across all university sites. The work of the CSTE continues and expands the activities already carried out by the university in the fields of energy consumption reduction, waste management, and sustainability.

The university recognises the importance of reducing its environmental impact, aligning its operations with national and international sustainability goals, such as Italy's National Energy Strategy and the European Green Deal. In practice, this is reflected in the adoption of energy-efficient technologies, such as the installation of photovoltaic panels, the upgrade of heating and cooling systems, and the implementation of energy-saving measures like LED lighting and automatic control systems. These actions not only contribute to lowering the university's carbon footprint but also result in significant cost savings, as demonstrated by the reduction in electricity consumption. The reduction in energy expenses reflects successful cost-saving measures that also contribute to the university's overall budget optimisation.

The university relies mainly on grid electricity, with substantial efforts toward reducing consumption. The electrical energy is essentially used for cooling the buildings (by using centralised or autonomous heat pump systems), lighting, heating part of the buildings, and other services (including the data centre). The heating systems operate on natural gas, showing the university's ongoing reliance on fossil fuels for thermal energy. However, the university is gradually integrating renewable energy sources, such as solar panels, in various locations across the campus. These contribute to reducing reliance on the grid and support the university's goals to lower its carbon footprint. Its campus profile—with a mix of historic and modern buildings—necessitates a phased and adaptive approach. The main university buildings are of historical value, many built before energy efficiency standards were in place, which presents a significant challenge for energy renovation.

Research and projects on renewable energy should be noted as a way to accelerate progress toward more sustainable and distributed energy solutions. Among the documents framing the energy strategy at UNIPA, the University Energy Plan should be mentioned. It defines the future energy scenarios based on the analysis of the current situation (analysis of project documentation, energy bills, online platform data, physical inspections, etc.).

Among the specific goals of UNIPA, the Energy Efficiency Projects remain a strong priority, as well as Sustainability Awareness Campaigns (among them, initiatives highlighting energy-saving practices and the responsible use of resources).

Although Italy does not impose binding energy or climate obligations on HEIs, the University of Palermo has a clear sustainability-oriented trajectory, structured across several key institutional and national frameworks.

UNIPA's broad approach to sustainability integrates environmental, financial, and educational objectives, reinforcing the university's commitment and the scope of action. University not only ensures compliance but also strengthens its role as a model for sustainability in higher education. While the national framework provides a foundation, UNIPA distinguishes itself by pursuing additional, innovative actions, as in the case of the RUS network, where the university plays a leading role, not only as a co-founder but also as a coordinator for sustainability initiatives in Sicily.

Vilnius Gediminas Technical University – VILNIUS TECH is characterised by its focus on Technological and Engineering education and research, hosting an academic community of 9,000 students and 1,600 staff members, including 940 academic staff.

The university's rationale combines institutional autonomy with peer accountability and positions sustainability as a cross-cutting university action priority in its Strategy 2023–2030. To coordinate sustainability initiatives, the university established a Sustainability Centre in 2022, with a focus on interdisciplinary education and training activities on campus.

Operating on a compact, centralised campus, VILNIUS TECH benefits from recent upgrades in line with nearly-zero energy building standards. Its energy use relies on district heating, grid electricity, and a limited but expanding collaboration with external stakeholders on sustainability matters. However, managing a mix of newly built premises with historical heritage and buildings from the late '70s, the university focuses on facilitating a data-driven approach to infrastructure planning and energy savings. Energy consumption is tracked with building-level smart meters. Renewables (solar PV installations) are among the highest priorities in the near future.

Institutional strategies are formalised in the VILNIUS TECH Development Plan, which integrates sustainability with digital innovation and technical education.

Several faculties incorporate sustainability-focused curricula, while campus operations emphasise measurable energy performance with the specific goals:

- Expanding solar PV capacity, particularly on new construction,
- Promoting low-energy design principles in renovated buildings,
- Leading in sustainability education and training within Lithuania.

VILNIUS TECH's technology-oriented profile makes it well-positioned to serve as a partner for solving sustainability challenges, especially in building energetics, green energy, and waste management areas.

The **University of Novi Sad (UNS)**, with almost 50,000 students and 5,000 employees at 14 faculties and three institutes in four historic university cities—Novi Sad, Sombor, Subotica, and Zrenjanin—is one of the largest educational and research centres in Central Europe.

The university operates under general public-sector energy efficiency regulations, such as Serbia's Climate Change Law (2021) and the Energy Law. According to the national report, the university has begun developing its institutional energy policy in response to both national strategic goals and the need for improved infrastructure performance. Its rationale centres on increasing energy efficiency, modernising infrastructure, and reducing operating costs. UNS utilises a mix of traditional and renewable energy sources. The university spans more than 100 buildings; parts of the campus still rely on outdated systems, which present a challenge to achieving energy efficiency goals. While grid electricity and natural gas remain primary sources for daily operations, efforts have been made to integrate renewable energy solutions and improve energy efficiency across the campus. Current energy use patterns rely on electricity, natural gas, and district heating, with a few pilot PV installations under development. Infrastructural complexity and administrative fragmentation are cited as barriers to coordinated action, but steps have been taken to appoint energy managers and initiate campus-wide energy audits.

While UNS does not have a standalone energy policy, energy concerns are embedded within broader initiatives such as infrastructure modernisation, research on sustainability, and participation in international projects like Horizon Europe, EU Interreg, and Erasmus+. These frameworks often emphasise resource efficiency and green campus initiatives and facilitate the gradual integration of sustainability topics into the university's Development Strategy. UNS has developed an Action Plan for Sustainable Energy (SEAP) in Novi Sad, which will facilitate future activities in terms of energy efficiency projects, renewable energy adoption, and public awareness campaigns. Partnerships with national and international partners and the use of external agency funding are accelerating the transition of the university towards a more holistic and complex strategy-making on sustainability. Considering current institutional needs, the specific institutional goals include:

- Upgrading infrastructure to increase energy efficiency and enhance reliability in critical operations;
- Deploying renewable energy sources like solar power, contributing to a low-carbon economy;
- Raising awareness among students and staff about energy-saving practices and the importance of sustainability, fostering long-term cultural change.

As one of Serbia's leading institutions, UNS plays a vital role in regional development. An energy policy would position the university as a leader in sustainable development for the community and businesses and help achieve Serbia's national and EU-aligned climate goals.

The **University of Alicante (UA)** is a public university with approximately 30,000 students enrolled and over 4,000 employees, of which around 2,500 are academic staff and 1,500 administrative staff. The university campus covers 1,000,000 m^2, with access to an additional 1,000,000 m^2 for expansion. It is located near the city of Alicante, featuring purpose-built infrastructure with

substantial potential for efficient energy management and renewable energy development. Moreover, the university has several university centres located in towns of the province (Alicante, Biar, Calpe, Cocentaina, Elda, La Nucía, Petrer, Torrevieja, Benissa, Orihuela, Villena, Xixona & Villajoyosa) where academic and cultural activities are carried out. Many of these activities are related to the socio-economic and cultural environment of the locality. As emphasised in the national report, due to the decentralised nature of Spain, different strategies and policies (national, regional, and local long-term strategies) in the field of Energy & Climate shape the University of Alicante.

UA's energy strategy is driven by both compliance with national public-sector energy efficiency regulations and its institutional objective of becoming a model of green campus transformation. This involves energy audits, real-time energy monitoring, integration of renewable energy systems, and awareness campaigns targeting the university community. The university's energy use combines grid electricity, district heating, and a growing proportion of solar PV installations. Through its centralised energy monitoring platform (Sistema de Gestión Energética), UA actively manages energy consumption and targets inefficient buildings for intervention. The university's "UA Campus Sostenible" initiative integrates these measures into daily operations and planning. The University Social Responsibility Plan reflects the aim to reduce and compensate for GHG emissions and combat climate change, which includes, among others, proposals for energy-saving mechanisms for buildings, in accordance with the GHG Emissions Protocol or standards based on said protocol. Agenda 21, which is included in the general UA Social Responsibility Plan, establishes the Strategic Line on efficient use of energy, with corresponding measures. The aim of this strategic line is to maximise energy savings and promote clean and renewable energies. Actions are therefore proposed to improve the energy management of the UA Campus, both through the optimisation of facility consumption and the application of renewable energy sources. The specific goals of the university include:

- Achieving the 10% public-sector energy reduction target imposed by national RDL 14/2022;
- Scaling photovoltaic systems across campus buildings;
- Enhancing student engagement through workshops and mobility programs;
- Positioning the university as a regional sustainability leader and reference point.

Institutional Involvement for Action

The overview of the institutional practices was complemented by the analysis of the distribution of the roles in different activities, which range from decision making to implementation of the corresponding strategy on Energy resources. This survey was aimed at activating stakeholder-engagement focus when analysing institutional practices. The aggregated results of partner reports show who the actors are responsible for setting strategies and guidelines, monitoring, evaluation, reporting and communication in the academic communities. The main aim of this part is to identify how responsibilities for implementation are shared, and who are the main actors responsible for setting strategies and guidelines, monitoring, evaluation, reporting and communication on the goals, action and results. The main question beyond is how the participation and engagement level of the academic community is ensured. The data for this part of the report was collected in a structured manner by assessing the role of different target groups: function, main actors, student and staff engagement. The engagement has been assessed using a 5-point Likert scale.

Developing strategy. Strategic decision-making, setting strategic goals, measures and guidelines

The development of strategic energy-saving goals and guidelines across the analysed countries is primarily led by high-level university authorities such as chancellors, rectors, or executive departments. While collaboration typically includes academic and facility management units, the involvement of students varies significantly. Overall, student engagement in this phase is relatively low, with most countries rating it between 2 and 3, except for Lithuania, which stands out with a higher level of inclusion. In contrast, staff engagement is consistently stronger, with most institutions reporting moderate to high involvement, particularly in Lithuania, Italy, and France.

Developing strategy. Strategic decision-making, setting strategic goals, measures and guidelines	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	In all countries, strategic planning is led by high-level university authorities such as chancellors, rectors, vice-presidents, or top-level management units.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Collaboration involves a mix of academic bodies, facility managers, and student representatives or environmental groups, with varying levels of student input across countries.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement is relatively low in most countries (average 2.5), with Lithuania being the only one rating it high at 4.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is generally moderate to high (average 3.5), with the highest involvement seen in Lithuania, Italy, and France.

Developing an Institutional Action Plan

The development of institutional action plans is managed by senior university bodies such as chancellors, rectorates, and management departments across all countries. While collaboration involves student representatives, technical staff, and environmental units, the extent of stakeholder involvement varies. Student engagement in this process is consistently low, indicating that this task has limited influence on encouraging individual student participation. In contrast, staff engagement is moderate to high, especially in Italy and France, where both administrative and academic staff appear to be more actively involved.

Developing institutional Action Plan	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	High-level university authorities such as chancellors, rectorates, councils, and management departments are responsible for institutional action planning across all countries.

CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Collaboration includes student representatives, technical and administrative units, and environmental groups, with stakeholder involvement varying in scope.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement is consistently low (average 2.3), showing limited influence of this task on individual student participation.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is moderate to high (average 3), with Italy and France indicating a stronger involvement of administrative and academic staff in this action.

Setting energy resource management KPIs

The process of setting energy resource management KPIs is led by top university bodies such as rectorates, chancellors, or internal and environmental management departments, often supported by faculty or facilities units. Collaboration typically involves technical departments, research structures, and, in some cases, student or environmental organizations. Student engagement in KPI setting is minimal across all countries, with an average score of just 1.7, indicating little influence on student involvement. Staff engagement is slightly better (average 2.7), with France standing out as the country reporting the highest level of staff participation in this area.

Setting energy resource management KPIs	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	KPI setting is handled by top university entities such as chancellors, rectorates, internal audit offices, or environmental management departments, often in coordination with faculty or property units.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Supporting roles are played by technical departments, planning units, research structures, and student or environmental organizations depending on institutional setup.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student involvement is minimal across all countries (average 1.7), showing very limited influence on student engagement in KPI setting.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is moderate (average 2.7), France shows the highest level of staff participation in this action.

Providing resources for implementation

The provision of resources for implementation is overseen by departments handling finance, property, or energy, typically operating under high-level university management. Collaboration involves administrative, academic, and technical units, along with occasional input from student unions and environmental groups. Student engagement in this area is mixed (average 2.7), with limited involvement in Spain, Italy, and France, but higher ratings in Serbia and Austria. Staff engagement is comparatively strong (average 3.5), especially in Austria, France, and Serbia, highlighting the central role of academic and administrative personnel in resource allocation.

Providing resources for implementation	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Resource provision is primarily managed by departments responsible for finance, property, facilities, or energy, typically under executive or top-level oversight.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Support comes from administrative, academic, and technical units, with some involvement from student unions and environmental advisory groups.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement varies (average 2.7), with low scores in Spain, Italy, and France, but higher involvement seen in Serbia and Austria.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is stronger overall (average 3.5), especially in Austria, France, and Serbia, suggesting a key role for academic and administrative staff in implementation.

Developing infrastructure

Infrastructure development is generally managed by property and facility management departments, rectorates, or through outsourcing, depending on the national context. Collaboration involves technical, administrative, and planning units, alongside environmental and student-focused groups such as Green Buddies. Student engagement in this area is moderate overall (average 2.8), with Serbia showing the highest involvement; Lithuania did not report data. Staff engagement is more consistent and generally high (average 3.5), with the strongest participation seen in Italy, and solid involvement across France, Serbia, and Austria.

Developing infrastructure	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Infrastructure development is typically led by property and facility management departments, rectorates, or outsourced providers, depending on the country.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Support comes from technical or administrative units, infrastructure planning offices, or environmental and student-focused groups like Green Buddies.

EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement varies across countries (average 2.8), with the highest engagement in Serbia and moderate involvement in France and Austria; Lithuania does not provide data (n.a).
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is moderate to high (average 3.5), with the highest participation reported in Italy and consistently good involvement across France, Serbia, and Austria.

Implementing the strategy or action plan

The implementation of energy strategies or action plans is generally overseen by facility or property management departments, rectorates, or high-level operational units. Collaborative efforts involve academic staff, students, administrative teams, external contractors, and green/environmental groups, with some countries allowing voluntary participation. Student engagement in implementation is moderate to high (average 3.2), with Serbia and France showing the most active student involvement. Staff engagement is notably strong across the board (average 4.2), particularly in Serbia, Italy, and Austria, highlighting a key role for staff in bringing action plans into practice.

Implementing the strategy or action plan	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Implementation is typically led by facility or property management units, rectorates, or high-level departments responsible for infrastructure and operations.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Collaboration includes academic staff, students, administrative units, external contractors, and green/environmental groups, with flexibility for voluntary contributions in some countries.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement is moderate to high (average 3.2), with the strongest involvement in Serbia and France.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is very high in most countries (average 4.2), especially in Serbia, Italy, and Austria, indicating strong participation in implementation activities.

Organising community engagement

Organising community engagement is primarily managed by communication departments, rectorates, or high-level administrative units dedicated to outreach. Collaboration spans communication offices, student groups, academic and technical staff, as well as environmental and stakeholder organizations. Student engagement in this area is exceptionally high (average 4.5), with Lithuania, Serbia, France, and Austria all reporting the highest possible score. Similarly, staff engagement is also strong (average 4.3), particularly in those same countries, highlighting robust participation across the university community.

Organising community engagement	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Responsibility typically lies with communication departments, rectorates, and administrative or top-level management units focused on outreach and engagement.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Collaboration includes communication offices, student associations, technical and academic staff, and environmental or stakeholder groups.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement is very high overall (average 4.5), with Lithuania, Serbia, France, and Austria scoring the maximum of 5.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is also high (average 4.3), especially in Lithuania, Serbia, and Austria, reflecting strong cross-community participation.

Monitoring (tracking) results and performance

Monitoring and tracking of results and performance are typically managed by facility/property departments, rectorates, or oversight bodies such as internal audit and compliance units. Collaborating entities include IT departments, technical teams, research structures, and both student and staff groups. Student engagement in monitoring is generally low (average 2.3), with Lithuania and Spain at the bottom (score 1), and Serbia reporting the highest involvement (score 4). Staff engagement varies more (average 3.2), with strong participation in Austria and Serbia, while Lithuania and Spain again show minimal involvement.

Monitoring (tracking) results and performance	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Monitoring activities are carried out by facility/property management units, rectorates, or specialized oversight bodies such as audit and compliance departments.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Collaboration includes IT departments, technical units, research structures, and student/staff groups depending on the institution.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement in monitoring is generally low (average 2.3), with Lithuania and Spain scoring the lowest (1), and Serbia the highest (4).
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement varies more widely (average 3.2), with Austria and Serbia reporting high involvement, while Lithuania and Spain show minimal staff participation.

Evaluating results and providing feedback

Evaluation and feedback processes are overseen by institutional governing bodies such as rectorates, councils, deans, or quality assurance and environmental departments. Key contributors include IT and communication units, academic staff, and student bodies, with some institutions also involving strategic planning teams. Student engagement in this task varies notably (average 2.8), with Lithuania showing the strongest involvement and Spain the weakest. Staff engagement follows a similar pattern (average 3.8), peaking in Lithuania and Austria and again being lowest in Spain, reflecting a diverse range of institutional approaches to feedback participation.

Evaluating results and providing feedback	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Evaluation and feedback are managed by governing bodies such as rectorates, councils, deans, quality assurance units, or environmental departments.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Supporting contributors include IT and communication units, academic staff, and student bodies, with some countries engaging strategic planning departments.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement in evaluation and feedback is mixed (average 2.8), with Lithuania showing the highest involvement and Spain the lowest.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is stronger overall (average 3.8), with Austria and Lithuania reporting the highest participation, while Spain shows the weakest results.

Sustaining improvements, updating institutional practices

Sustaining improvements and updating institutional practices is overseen by top or executive-level university leadership such as rectorates, chancellors, and directors, who ensure long-term integration of energy-related measures. Supporting actors include strategic planning teams, technical units, academic staff, students, and environmental or quality assurance departments. Student engagement is moderate (average 2.8), with fairly uniform participation across most countries, though slightly lower in Italy. Staff engagement is notably high (average 4.2), especially in Italy and Austria, highlighting the essential role of academic and administrative staff in maintaining institutional progress.

Sustaining improvements, updating institutional practices	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Responsibility lies with top or executive-level management, including rectorates, chancellors, and directors, who oversee the long-term integration of energy practices.

CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Support units include strategic planning departments, technical units, students, academic staff, and environmental or quality assurance teams.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement is moderate overall (average 2.8), with similar levels across most countries, and slightly lower in Italy.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is high (average 4.2), particularly in Italy and Austria, indicating that institutional updates rely heavily on administrative and academic staff input.

Communication of the strategy, action results

Communication of the strategy and its outcomes is overseen by rectorates, communication departments, or other high-level units depending on the country. Key collaborators include central communication teams, Ecocampus offices, students' parliaments, green councils, academic and administrative staff, faculties, institutes, schools, student unions, and external partners. Student engagement in communication activities is moderate overall (average 3.3), it is high in Lithuania, Italy, Serbia, and France, lowest in Spain and Austria. Staff engagement is generally strong (average 4) among almost all observed countries, with Serbia showing the highest outcome. Spain reports the lowest engagement.

Communication of the strategy, action results	
MAIN IMPLEMENTING BODIES, UNITS. ACTORS	Communication efforts are managed by rectorates, communication departments, or top-level units involved in the strategy, depending on the country.
CONTRIBUTING, COLLABORATING UNITS, BODIES, GROUPS OF ACTORS (E.G FACILITY MANAGEMENT UNIT, STUDENTS, STAFF)	Key contributors include central communication units, green/environmental groups, academic staff, students, and external partners.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STUDENT	Student engagement in communication activities is moderate overall (average 3.3), with Lithuania, Serbia, Italy, and France showing higher involvement, while Spain and Austria remain weaker.
EVALUATE TO WHAT EXTENT THIS ACTION INFLUENCES THE INDIVIDUAL ENGAGEMENT OF THE STAFF (ADMIN + ACADEMIC)	Staff engagement is generally strong (average 4), with Serbia achieving the highest involvement, while Spain records the lowest outcome.

2. IDENTIFY BEST PRACTICES AND CHALLENGES

The second report was dedicated to gain a deeper understanding of existing experiences, past practices, and emerging issues. Therefore, partner universities were asked to identify the challenges they had encountered and the best practices they had implemented in the sustainable management of energy resources. The collected cases reflect technical and infrastructural innovations, as well as behavioural change, stakeholder engagement and learning-driven

initiatives. The following table 2 provides a comparative summary of the key challenges and best practices identified by each partner institution.

Table 2. Comparative summary of the key challenges and best practices identified by each partner institution

	BEST PRACTISES
University of Graz (Austria)	1. Institutional Carbon Management 2. Efficient Electrical Energy Use
University of Montpellier (France)	1. A set of small actions to raise awareness among campus users about ecological transition and reducing energy consumption 2. Implementing management actions to save energy at a central level
University of Palermo (Italy)	1. Energy Consumption Monitoring Platform 2. Photovoltaic Systems Installation 3. Energy Awareness Campaigns 4. Development of a Greenhouse Gas Emissions Inventory and Estimation of the University's Carbon Footprint
VILNIUS TECH (Lithuania)	1. VILNIUS TECH Participation in Project for Students' Engagement in Energy-Saving Practice (Project SAVES / Student Switch Off) 2. Launching Sustainability Hub in VILNIUS TECH
University of Novi Sad (Serbia)	1. GReENERGY – Greening the cities 2. GReENERGY2.0 – Greening the cities 2.0 3. CREATEGREEN – Creating energy and environment conditions for greener and sustainable Croatia-Serbia cross-border region
University of Alicante (Spain)	1. Renewable Energies: Consumption & Installation 2. Carbon Footprint Calculation 3. Energy Consumption Monitoring & Smart University 4. Desalination Plant
	CHALLENGES
University of Graz (Austria)	1. Thermal Energy Dependence 2. Mobility and Business Travel
University of Palermo (Italy)	1. Bureaucratic Hurdles in Procurement, Installation, and Funding 2. Lack of Institutionalized Roles for Energy Management
VILNIUS TECH (Lithuania)	1. Maintaining student motivation and engagement in long-term campaigns 2. Technical difficulties with energy monitoring dashboard 3. COVID-19 disrupting in-person activities 4. Transition from EU funding to self-funded model (financial sustainability issues)
University of Novi Sad (Serbia)	1. Structural and technological barriers (e.g., retrofitting old buildings) 2. Financial challenges (e.g., funding large-scale projects) 3. Socio-cultural barriers (e.g., lack of awareness and behavioral resistance)

University of Alicante (Spain)	1. Financial challenges – High investment costs for energy projects 2. Structural challenges – Aging buildings needing deep retrofitting for energy efficiency

The University of Graz presents two **best practices** in sustainable energy management.

Firstly, the university's Institutional Carbon Management (ICM) system takes a strong, data-driven approach to achieving climate neutrality by 2040. This initiative is notable for its high-level leadership, with the Rector personally chairing the Climate Protection Advisory Board, as well as for its interdisciplinary collaboration between scientists and administrative units. The project integrates detailed emissions tracking and stakeholder participation, engaging staff, students and faculty alike, and embeds sustainability goals within institutional governance.

The second case study, 'Efficient Electrical Energy Use', showcases technical measures to reduce energy consumption and promote the use of renewable energy sources. These measures include switching to UZ46-certified green electricity, retrofitting infrastructure with LED lighting and expanding photovoltaic systems. These measures are supported by strong institutional investment and strategic prioritisation.

Both cases can be easily transferred to other HEIs, provided there is institutional will, clear role allocation, and access to reliable green electricity sources.

Emphasising challenges, the **University of Graz** has identified two **main challenges** to achieving its sustainability goals: dependence on thermal energy and emissions related to mobility.

The university's reliance on district heating, which uses a non-renewable energy mix, creates structural and policy-related barriers that limit its autonomy when transitioning to renewable thermal energy. The problem regarding district heating is more about dependency than financial aspects, although geothermal systems are being integrated into new buildings and renovation projects are ongoing.

The second challenge relates to emissions from mobility, including commuting and business travel. Although the modal split among commuters is favourable, infrastructure gaps and behavioural barriers hinder progress towards low-carbon mobility. The introduction of the Green Academia Award and collaboration with local authorities are proactive steps to incentivise behavioural change and improve transport options.

Insights from interviews and focus groups further emphasise the need for greater investment in renewable energy technologies and improved data analytics for energy monitoring, as well as more integrated sustainability governance. While the EMAS scheme provides a solid institutional framework, challenges remain at departmental level where motivation and engagement can be inconsistent. Socio-cultural factors, such as individual energy-use habits and limited community engagement initiatives, are also frequently overlooked. The university recognises that building a sustainable energy culture requires commitment at the highest level, embedded policies, clear accountability structures and targeted engagement. Tools such as workshops, awareness campaigns and leadership role modelling are seen as essential to driving organisational transformation and individual behavioural change on campus and beyond.

The **University of Montpellier** takes a dual approach to energy transition, combining community-driven behavioural change with institutional-level management actions.

The first **best practice** focuses on raising awareness through small yet strategic actions, such as visible energy consumption reporting, a network of sobriety ambassadors and targeted staff training in ecological transition. The practical behaviour guidelines are particularly commendable for being easy to implement and highly transferable.

The second best practice focuses on a structured energy management system (EMS) and operational measures to reduce consumption. These include climate-based heating adjustments, automatic lighting and computer shutdown systems, HVAC optimisations, sub-metering and building renovations, many of which are supported by strategically mobilised national and regional funding. The initiative demonstrates robust institutional planning and strong alignment with national targets, notably the 40% reduction stipulated by France's Tertiary Decree. A notable strength is the integration of ecological transition into curricula and training programmes, ensuring long-term impact.

The main identified **challenge** is financial scale: achieving the full renovation target requires approximately €200 million, highlighting the need for sustained external investment. Nevertheless, Montpellier's comprehensive, multi-level model offers HEIs a robust, replicable framework for combining behaviour change with technical upgrades.

The **University of Palermo** provided several **best practices**, including the development of a real-time energy consumption monitoring platform designed to detect unnecessary energy use and enable immediate corrective action.

Another significant initiative is the installation of photovoltaic systems, which are intended to reduce reliance on fossil fuels and lower operational energy costs.

Following the 2022 energy crisis, the university launched energy awareness campaigns focusing on behavioural change through targeted communication, workshops and practical energy-saving tips for staff and students.

Another noteworthy practice is the development of a comprehensive greenhouse gas emissions inventory and carbon footprint estimation, coordinated by the Centre for Sustainability and Ecological Transition (CSTE). This initiative is notable for its strong stakeholder engagement, alignment with national and international sustainability targets, and use of the campus as a testing ground for innovative solutions.

Despite these advances, the university is facing two key **challenges**.

Firstly, bureaucratic hurdles in procurement, installation and funding delay the implementation of energy-efficient technologies, thereby increasing costs and undermining progress towards institutional targets.

Secondly, the absence of formalised institutional roles for energy management results in fragmented leadership and limited accountability, as responsibilities are frequently distributed informally among staff or academic personnel.

These challenges highlight the need for streamlined administrative processes, secured financial resources and dedicated sustainability roles to ensure the long-term effectiveness and coordination of energy transition efforts.

Vilnius Gediminas Technical University provided several **best practices**.

SAVES (Students Achieving Valuable Energy Savings) project is a dormitory-based behavioural change initiative, which has been rolled out across five EU countries. As part of the Student Switch Off campaign, students competed to reduce energy use with the support of dormitory coordinators, student ambassadors and a real-time energy dashboard that made saving energy more engaging. The project successfully promoted behavioural change, resulting in strong long-term habit retention and quantifiable energy savings. Face-to-face interactions proved to be the most effective engagement method, reinforcing the importance of combining digital tools with direct communication.

Another significant best practice is the Sustainability Hub, a multidisciplinary living lab established in 2022 to integrate sustainability research, education and stakeholder collaboration. The Hub features advanced data modelling zones, eco-design and sustainable consumption labs, indoor air quality monitoring and interdisciplinary learning programmes. Its open structure encourages participation from the academic community, schools, businesses and the wider public. The micro-credential modules are particularly innovative, promoting lifelong learning in energy efficiency, green technologies, and circular economy practices.

Despite these achievements, VILNIUS TECH has faced several **challenges**.

Within the SAVES project, it proved difficult to maintain student motivation over time, especially during the pandemic, as well as to ensure the technical reliability of the energy dashboard system. The transition from EU funding to self-funding raised concerns about financial sustainability, ultimately contributing to the project's discontinuation. The project's legacy highlights the importance of diverse and stable funding sources, robust engagement strategies, and the early involvement of IT and energy managers in technical planning.

The Sustainability Hub's experience has also revealed that engaging with external partners and enabling long-term cooperation are key to achieving impactful outcomes.

These initiatives demonstrate that success in sustainable energy management depends not only on technical solutions, but also on culture-building, cross-sector partnerships and sustained institutional commitment.

The **University of Novi Sad** provided several **best practices**, including the GReENERGY, GReENERGY 2.0 and CREATEGREEN projects.

The GReENERGY project involved installing solar power (213 kW), green roofs and walls on public buildings, achieving reduced energy consumption and increased public awareness in two cities.

Building on this foundation, GReENERGY 2.0 introduced additional solar installations and a green wall, along with workshops and open-door events to engage local communities.

CREATEGREEN builds on this model by installing solar power plants in Novi Sad, Sombor and Osijek. These are combined with micro-meteorological sensors and data-driven platforms to monitor solar energy efficiency across the region.

These initiatives are notable for their innovative combination of green infrastructure, stakeholder collaboration, community engagement and tangible renewable energy outcomes. They serve as scalable examples for HEIs seeking large-scale infrastructure change aligned with EU objectives.

The university identified several **key *challenges*** as well.

Structurally, retrofitting older public buildings for solar panels and green infrastructure posed significant logistical and technical challenges.

Financially, securing sufficient investment and ensuring project continuity without external support remained critical obstacles, even with EU co-funding.

Socio-culturally, limited awareness among stakeholders threatened the adoption and maintenance of sustainable practices. Although awareness campaigns and workshops helped to mitigate this issue, achieving broader uptake depended on consistent stakeholder engagement.

Overall, the successful implementation of projects, particularly in cross-border HEI settings, relied on continued funding diversification, strong multi-sector partnerships, clear policy frameworks and strategies to build a culture of sustainability across institutional and community levels.

The **University of Alicante** identified several sustainable energy management **best practices**.

Notably, it only imports renewable electricity and has installed extensive photovoltaic systems across campus, producing over 400,000 kWh per year. A new project involving 3,612 solar panels is set to supply 15.35% of the university's annual energy demand, reducing CO_2 emissions by 772 tonnes each year. These initiatives are led by the Vice-Rectorate of Infrastructure and supported by the Technical Office and Ecocampus.

Another effective measure is the annual calculation of the carbon footprint (Scope 1+2), which tracks and guides reductions in emissions and is backed by the Ministry's official calculator. Since 2017, emissions have dropped from 8,766 tCO_2 to 778 tCO_2.

The university also uses a real-time energy monitoring platform (SIEMENS) and participates in the Smart University initiative, which optimises energy use, detects inefficiencies and informs strategy.

Another best practice is the university's desalination plant, which has been operational since 1996. This reverse osmosis facility produces 360 m^3 of water per day, primarily for irrigation purposes, and it is also used for research and training. Current efforts are underway to power the plant using photovoltaic energy to enhance its sustainability.

These practices can be transferred, particularly thanks to strong leadership, cross-departmental collaboration and public-private partnerships.

The main **challenges** are financial and structural.

Upgrading old infrastructure to improve energy efficiency requires significant investment. To overcome this challenge, the university partnered with Endesa X, which financed the solar installations in full with deferred payment terms.

Structural inefficiencies in older buildings, particularly with regard to thermal insulation and HVAC upgrades, remain a hurdle.

Behavioural change is encouraged through awareness campaigns and environmental volunteering, but technical upgrades have a far greater impact. Other requirements include improved interior lighting, better climate control systems and funding for efficiency upgrades. Although engagement is growing, individual behavioural change has a limited effect compared to systemic infrastructure improvements.

3. ASSESS EXISTING ENERGY KPIs AND DATA

The aim of this report is to identify and evaluate existing data on energy KPIs within HEIs. This involves specifying KPI metrics, assessing the availability and reliability of current data sources, and identifying gaps such as missing or unmonitored KPIs. The goal is to create a solid foundation for a roadmap of existing practices.

The report contains a detailed compilation of energy-related KPIs from six European universities. It includes:

- Tracked KPIs: Such as electricity and heating consumption, energy efficiency, renewable energy use and generation, and energy savings.
- Data Sources: Where and how each university collects its energy data.
- Data Availability: Which data is complete, partial, or missing.
- Unmonitored KPIs: Important metrics that are not yet tracked, like carbon intensity, energy intensity, and waste heat utilisation.

Each university's section follows the same structure, making it easy to compare practices and identify gaps in energy monitoring across institutions.

3.1 OVERVIEW OF THE TRACKED ENERGY KPIs

This section provides a comparative summary of the energy-related KPIs currently monitored by participating universities. It highlights the types of energy metrics tracked, including electricity and heating consumption, energy efficiency, and renewable energy use. This provides insight into each institution's focus areas and data maturity level. The overview serves as a foundation for identifying best practices and areas needing improvement across the institutions. The detailed comparison is presented in Table 2, and in Table 3 all common KPI are presented.

Table 2. Detailed comparison of monitored KPIs

KPI CATEGORY	MONTPELLIER	UNI GRAZ	UNS	VILNIUS TECH	UNIPA	UA
Electricity Consumption	✓	✓	✓	✓	✓	✓
Heating Consumption	✓	✓	✓	✓	✓	✗
Energy Efficiency	✗	✓	✓	✓	✓	✓
Energy Savings	✗	✓	✗	✗	✓	✓

Renewable Energy Consumption	✗	✓	✗	✓	✓	✓

Table 3. KPIs which are tracked in each university

UNIVERSITY	TRACKED KPIS
University of Montpellier (France)	Total electricity and gas consumption
University of Graz (Austria)	Electricity and heating consumption, energy efficiency, renewable energy use and generation, energy savings
University of Novi Sad (Serbia)	Electricity and heating consumption, energy efficiency
Vilnius Gediminas Technical University (Lithuania)	Electricity and heating consumption, energy efficiency, renewable energy use and generation
University of Palermo (Italy)	Electricity and gas consumption, energy efficiency, renewable energy use and generation
The University of Alicante (Spain)	Electricity and heating consumption, energy efficiency, renewable energy use and generation, energy savings, carbon intensity

The **University of Montpellier** focuses on basic consumption metrics, specifically total electricity and gas consumption. However, data is only available for the year 2019, with no ongoing monitoring in subsequent years. This limited scope reflects an early stage in energy data management, although reduction targets for 2024 have been set.

In contrast, the **University of Graz** demonstrates a comprehensive and advanced approach. It tracks total electricity and heating consumption, including breakdowns for solar thermal and district heating. The university also monitors energy efficiency per square meter, energy savings in a 3-year comparison, and the share of renewable energy in total consumption. Additionally, it records electricity generation from renewable sources. This level of detail indicates a mature and integrated energy monitoring system.

The **University of Novi Sad** tracks electricity and heating consumption and reports a basic energy efficiency metric. However, it lacks data on renewable energy use, energy savings, and generation, suggesting a more foundational level of monitoring focused primarily on consumption.

Vilnius Gediminas Technical University also maintains a strong monitoring framework. It tracks electricity and heating consumption, energy efficiency, and renewable energy use, with 100% of electricity and over 60% of district heating sourced from renewables. Although electricity generation from renewables is partially monitored, especially in laboratory settings, the university shows a clear commitment to sustainability.

The **University of Palermo** offers a detailed and service-specific breakdown of energy use. It monitors total electricity and gas consumption, electricity used by service type (such as lighting and cooling), and multiple energy efficiency indicators. It also tracks energy savings, the share of renewable energy, and the ratio of installed to potential renewable energy capacity. This level of granularity supports targeted energy management and planning.

The **University of Alicante** has a well-developed energy monitoring system, tracking total electricity and heating consumption, both sourced from 100% renewable suppliers. It monitors energy efficiency for electricity and heating, with real-time data available through the KUUNA platform. Energy savings are also tracked and carbon intensity is calculated using the ECOCAMPUS tool. Electricity generation from renewables is currently limited to specific installations (e.g. Petrology Parking), with broader monitoring expected from September 2025.

In summary, while all universities track basic consumption metrics, only a few, such as Graz, Vilnius, Alicante and Palermo, extend their monitoring to include efficiency, energy savings and the integration of renewable energy. This comparison highlights the varying levels of energy data maturity and the potential for shared learning and standardisation across institutions.

3.2 DATA SOURCES AND MONITORING

The second part of the survey focuses on the data sources and monitoring systems used by each university to track their energy KPIs. It reveals the institutional structures, tools, and update frequencies that support energy data collection and management.

At the **University of Montpellier**, energy data is sourced from utility billing records, with the facilities department responsible for monitoring. However, updates are conducted only on a yearly basis, and the data is limited to a single year, indicating a minimal and infrequent monitoring system.

The **University of Graz** demonstrates a more advanced and structured approach. It uses a combination of utility billing records, internal energy monitoring systems, and specific meters for photovoltaic and solar thermal systems. The Directorate of Resources and Planning oversees the data collection, with responsibilities assigned to the experts of Buildings and Technology. Data is updated either monthly or annually, depending on the KPI. This layered system allows for both high-frequency updates and comprehensive coverage of energy performance.

At the **University of Novi Sad**, data is also primarily collected through utility billing records. The management of individual faculties, along with designated energy managers, is responsible for tracking energy use. Updates are performed annually. While the structure is in place, the scope of monitoring is narrower, focusing mainly on basic consumption metrics.

Vilnius Gediminas Technical University relies on utility billing records as well, with the Facility Management Department overseeing the process. Data is updated annually, and renewable energy data is also sourced from suppliers. The university benefits from a centralised supplier that provides 100% renewable electricity, simplifying the tracking of renewable energy use.

The **University of Palermo** employs both utility billing records and a dedicated monitoring system to track energy consumption and generation. The Facilities Office and energy manager staff are responsible for data collection, with updates occurring annually. The use of a monitoring system allows for more detailed tracking, including service-specific electricity consumption and renewable energy generation.

At the **University of Alicante**, energy data is collected through a combination of utility billing records and advanced digital monitoring tools. The Technical Unit is responsible for electricity and heating consumption data, while the SMART UNIVERSITY team oversees energy savings and renewable energy monitoring via the KUUNA platform. KUUNA enables real-time data tracking at 15-minute intervals, offering detailed insights into consumption patterns. Updates occur monthly through invoices and are also summarised annually. ECOCAMPUS calculations provide carbon intensity data. This integrated approach, supported by cross-departmental collaboration, ensures a high-frequency, reliable monitoring system that covers most campus buildings, with further expansion underway.

In summary, while all universities use utility billing records as a foundational data source, the sophistication of their monitoring systems varies. Universities like Graz, Alicante and Palermo integrate internal monitoring tools and assign clear departmental responsibilities, enabling more frequent and detailed data collection. Others, such as Montpellier and Novi Sad, rely on simpler structures with less frequent updates, which may limit their ability to respond dynamically to energy performance trends.

3.3 DATA AVAILABILITY

The data availability section of the survey highlights significant differences in how comprehensively each university tracks and maintains its energy data. Some institutions, such as the University of Graz, Vilnius Gediminas Technical University and the University of Alicante, have nearly complete data sets for most KPIs, supported by regular updates and integrated monitoring systems. Others, such as the University of Montpellier and the University of Novi Sad, have significant gaps, with data either limited to a single year or missing entirely for key indicators such as renewable energy use and energy savings. In several cases, data is partially available or based on estimates, particularly for metrics such as energy efficiency and savings that depend on historical baselines or building-specific measurements. These inconsistencies point to the need for more standardised and continuous data collection practices across facilities. A summary of data availability and gaps is presented in Table 4.

Table 4. Summary of data availability and identified gaps in each university

UNIVERSITY	DATA AVAILABILITY	GAPS IDENTIFIED
University of Montpellier (France)	Partial (only 2019 data)	No monitoring for other years
University of Graz (Austria)	Mostly complete	Some building-level efficiency and energy savings data are estimated
University of Novi Sad (Serbia)	Limited	No data on renewable energy or energy savings
Vilnius Gediminas Technical University (Lithuania)	Mostly complete	Partial data on renewable energy generation from labs
University of Palermo (Italy)	Mostly complete	Partial gas consumption data due to past billing practices

The University of Alicante (Spain)	Mostly complete	Data for on-site renewable generation is still being integrated; some external buildings lack detailed breakdowns

In summary, the analysis of data availability across universities reveals a mixed landscape. While some institutions maintain comprehensive and regularly updated data sets, others face significant gaps due to limited monitoring, outdated records, or reliance on estimates. These inconsistencies hinder effective energy management and comparison. Addressing these gaps through standardised data collection and improved monitoring systems is essential to building a reliable foundation for sustainability planning and performance evaluation in higher education.

3.4 UNMONITORED KPIs

During the survey, several unmonitored metrics were identified across the participating campuses, reflecting areas where energy performance tracking is still underdeveloped or absent. The most common unmonitored metrics include carbon intensity, energy intensity, and waste heat recovery. Some campuses also lack data on energy savings, battery storage usage. While a few institutions, such as Graz and Alicante, have started tracking carbon intensity, other indicators like energy intensity and per-user efficiency remain unmonitored across most universities. The reasons for these gaps vary, from a lack of infrastructure and monitoring equipment to the complexity of collecting data across different building types and energy systems. Addressing these unmonitored metrics is critical to achieving a complete and more accurate picture of institutional energy performance.

In summary, common unmonitored KPIs across institutions include:

- Carbon Intensity
- Energy Intensity
- Waste Heat Utilisation
- Battery Storage Usage

It is important to note that all institutions, except the University of Graz, do not monitor Green Commuting Metrics either. Graz does monitor them, but refers to them as the Modal Split.
These KPIs are essential for a holistic understanding of energy performance and environmental impact but require additional infrastructure or data integration.

4. ROADMAP FOR INTEGRATING NATIONAL STRATEGIES INTO INSTITUTIONAL POLICIES

The development of sustainable, energy-conscious university behaviour demands an integrated approach that links national priorities with institutional strategies, operational tools, and measurable outcomes. The overview of the national policy frameworks, institutional energy strategies and actions, stakeholder integration into process management, and the current landscape of monitored KPIs offers a foundation for designing a strategic, actionable roadmap for HEIs.

The proposed roadmap is not a prescriptive checklist but rather a flexible, adaptable pathway, grounded in the practical experiences of six European universities. These institutions, while differing in regulatory context, profile, and infrastructure, share a growing commitment to embed sustainability into their missions, operations, and cultures.

From Policy Alignment to Institutional Action

As demonstrated in the national policy overviews, universities are increasingly being shaped by ambitious national climate and energy frameworks, whether through direct legal obligations or through incentivised engagement with public-sector transformation strategies. Many HEIs now operate within a multi-layered policy ecosystem, where regulatory drivers, national climate goals, and EU-level commitments intersect with institutional plans and identification of larger potential, because of their profile and role peculiarities in the given context.

Institutions have responded by translating national goals into strategic plans. These strategies reveal common rationales: improving energy efficiency, reducing GHG emissions, integrating renewables, and embedding sustainability in academic and operational practices.

The roadmap pillars concern the use of KPIs for monitoring and evaluation. As the survey and national inputs show, while some institutions already operate structured sustainability management systems (e.g., with regular energy audits), others are still in the early stages of KPI systematisation. There is a wide variation in both the availability and granularity of monitored indicators. At present, most institutions monitor core energy KPIs such as electricity and gas consumption, building energy intensity, and renewable energy output. However, less attention is given to qualitative or impact-oriented KPIs, such as behavioural change, awareness, or cross-sector partnerships. Only a few institutions integrate education- and research-related KPIs into their sustainability frameworks, pointing to a need to broaden the scope of institutional monitoring systems.

Given this landscape, the proposed roadmap serves as an approach for institutions seeking to advance their sustainability transitions in alignment with national energy and climate goals. It provides structured phases—Assess, Plan, Implement, Monitor & Evaluate—to guide HEIs and their communities in transforming the goodwill and on-demand commitments into operational strategies, stakeholder-driven processes, and measurable impacts.

By anchoring this roadmap in the practices and experiences of partner institutions, the aim is to facilitate transferability, comparability, and continuous learning across contexts. The roadmap encourages institutions to move beyond compliance and toward leadership (by adding institution-specific and impact-focused KPIs into a roadmap) in the sustainable transformation of the higher education sector.

To support practical implementation, the roadmap is broken down into four key phases. Each phase includes concrete actions to help institutions align with national goals, develop tailored strategies, engage stakeholders, and monitor performance.

The diagram below illustrates the roadmap structure, and the table that follows explains each step in detail, offering a clear and actionable pathway for implementation.

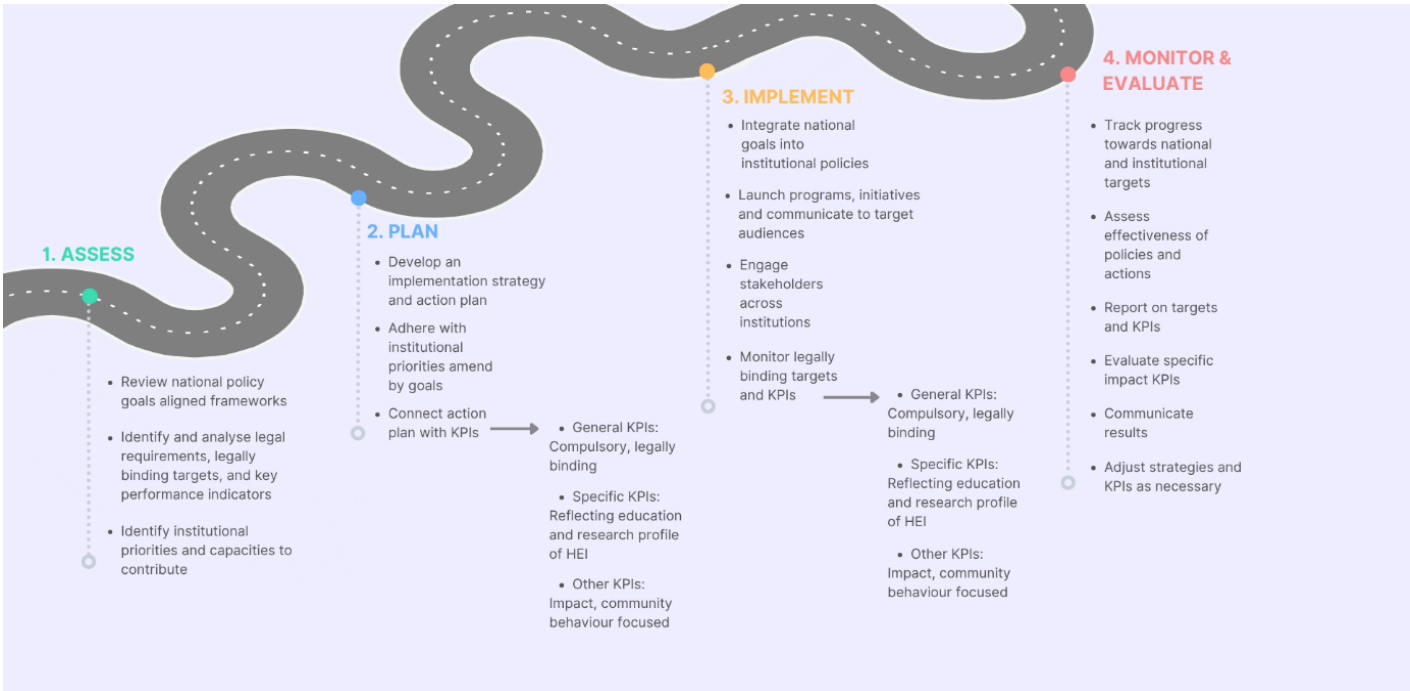

Figure 2. Unified consortium roadmap

Table 5. Explanation of the roadmap phases and associated institutional actions

STEPS	KEY ACTIONS
1. ACCESS	
The goal is to establish the baseline by reviewing the national policy goals and regulatory frameworks relevant to the institution.	- Review national policy goals and aligned regulatory frameworks. *Examine relevant national strategies and legal requirements related to sustainability, energy, or climate action.*
	- Identify legally binding targets and KPIs stemming from national policies. *Determine which performance indicators and targets are mandatory for higher education institutions.*
	- Identify institutional priorities and capacity to contribute. *Assess the institution's strategic objectives, resources, and readiness to support national goals.*

2. PLAN	
The goal is to develop a clear, actionable strategy that translates goals into operational steps.	- Develop institutional strategy for implementation. *Formulate a strategic plan aligned with national sustainability objectives, adapted to institutional context.*
	-Aligned with national priorities and transformed it into a detailed action plan. *Break down the strategy into specific actions, timelines, and responsible units.*
	-Connect the action plan with relevant KPIs *The selected KPIs should reflect both national policy expectations and the institution's own strategic goals.* • *General KPIs: These are compulsory, legally binding indicators set by national or regional authorities. Institutions are required to monitor and report on them.* • *Specific KPIs: Tailored to the education and research profile of the higher education institution (HEI), these reflect its core mission and local priorities.* • *Other KPIs: These focus on broader impacts such as behavioural change, stakeholder engagement, or community-level outcomes, helping institutions capture social and environmental dimensions of sustainability.*
3. IMPLEMENT	
The goal is to integrate the plan into operational activities and institutional policies.	- Integrate national goals into institutional policies. *Embed sustainability goals into official documents, regulations, and operational processes.*
	- Launch programs and initiatives, communicate to target audiences. *Execute planned actions and ensure visibility through internal and external communication.*
	- Engage stakeholders across institutions. *Involve various departments, staff, and students to ensure shared responsibility and ownership.*
	- Monitor legally binding targets and KPIs *Monitoring supports compliance with national regulations and helps evaluate institutional performance in real time.*

	• *General KPIs: These are compulsory and legally binding. Institutions must report on them to comply with national or regional policy requirements.* • *Specific KPIs: Reflecting the institution's educational and research focus, these KPIs allow monitoring of goals tailored to the HEI's mission and local context.* • *Other KPIs: These track broader impacts, such as community engagement and behavioural change, helping to assess social dimensions of sustainability performance.*
4. MONITOR & EVALUATE	
The goal is to track progress, assess performance, and adapt strategies.	- Monitor progress towards both national and institutional targets. *Regularly collect and analyse data to measure advancement toward set objectives.*
	- Evaluate the effectiveness of policies, programs, and actions. *Assess whether implemented measures are producing desired results.*
	- Report on legally binding targets and KPIs. *Communicate outcomes to authorities and internal stakeholders.*
	- Assess specific impact KPIs and collect feedback from stakeholders. *Use stakeholder input to understand qualitative impacts and refine indicators.*
	- Communicate results and adjust strategies or action plans as required. *Share findings transparently and update plans to respond to challenges and lessons learned.*
	- Adjust strategies, and develop an action plan as necessary. *Based on evaluation findings, refine institutional strategies and update the action plan to ensure continued relevance and effectiveness.*

CONCLUDING REMARKS AND RECOMMENDATIONS

1. An analysis of six national contexts reveals a diverse yet convergent landscape in which HEIs are increasingly aligning with national and European energy and sustainability strategies. While all countries share the overarching goals of the European Green Deal and Agenda 2030, their approaches and enforcement mechanisms vary significantly — from binding legal frameworks in countries such as Austria and France, which directly shape university action, to more voluntary and incentive-based models in countries such as Lithuania, Italy and Serbia.

Despite this variation, all of the HEIs examined are engaging with national priorities, either by complying with formal obligations or by making voluntary commitments and launching initiatives. The study reveals three prevailing models of institutional response: full legal alignment, partial regulatory engagement, and voluntary adoption. These models correspond to national expectations, legal structures, and funding mechanisms, but also to the universities' own mission-driven leadership and their perceived role in accelerating the green transition.

The interplay between national imperatives and institutional strategies is therefore not merely a top-down compliance mechanism, but rather a dynamic process of mutual reinforcement. Universities act as both implementers of national climate objectives and autonomous agents capable of innovation, policy interpretation, and sustainability leadership.

This comparative overview provides a solid foundation for designing a common roadmap for HEIs. Even in the absence of uniform legislation, it illustrates that shared goals, proactive institutional strategies and stakeholder engagement can enable higher education to contribute meaningfully to national and European sustainability transitions.

Analysis of the institutional strategies and practices of the six participating HEIs reveals a shared commitment to advancing sustainability and energy efficiency. However, the depth and formalisation of these efforts vary depending on national regulatory contexts and internal governance capacities. Despite differences in size, infrastructure and energy profiles, all universities have taken strategic steps to align with national and European sustainability agendas.

Many institutions have developed detailed energy and sustainability frameworks, including action plans, KPIs and dedicated sustainability units or centres. While some universities (the University of Graz and the University of Montpellier) operate under binding national mandates, others (the University of Palermo and VILNIUS TECH) rely on voluntary commitments and institutional autonomy. Renewables, building retrofits, and digital energy monitoring emerge as key priorities across the cases.

A structured survey of institutional roles and engagement patterns highlights a consistent trend: staff engagement is stronger than student involvement in almost all phases of strategy development and implementation. While staff play a central role in strategic planning, KPI setting and resource management, students are more involved in community engagement and communication activities. Notably, countries such as Austria, France, Lithuania and Serbia demonstrate relatively higher levels of student engagement, particularly in the outreach and implementation phases.

These findings emphasise the importance of integrating student perspectives into the initial stages of policy and strategy design to foster a more inclusive governance model and strengthen behavioural change and institutional ownership. Enhancing the participation of both staff and students in energy-saving measures is essential for building resilient and accountable sustainability cultures in HEIs.

2. A comparative overview of partner universities' good practices and main challenges reveals that achieving effective energy sustainability in HEIs requires a combination of strategic leadership, technological innovation and stakeholder engagement. Universities such as Graz and Montpellier exemplify the importance of institution-wide governance frameworks that integrate carbon management and energy efficiency into their operational and academic missions. Palermo and Alicante are notable for their advanced energy monitoring systems, photovoltaic installations and carbon footprint tracking, which are supported by robust cross-departmental collaboration. Meanwhile, VILNIUS TECH and Novi Sad showcase the potential of student engagement, behavioural change campaigns and regional green infrastructure projects in fostering cultural shifts towards sustainability.

Despite their diverse local contexts, all of these institutions face shared challenges, particularly financial constraints and outdated infrastructure, which limit the pace and scale of change. These findings emphasise the importance of long-term investment strategies, formal sustainability roles and integrating sustainability into curricula and institutional identity. Together, these examples offer a transferable roadmap for HEIs striving to reduce their environmental impact and lead the transition towards climate-neutral campuses.

3. The comparative analysis highlights the strengths and gaps in energy KPI tracking across the participating universities. The University of Graz and Vilnius Gediminas Technical University are leading in terms of comprehensive data availability and monitoring systems, closely followed by the University of Alicante, which demonstrates a high-frequency, digital monitoring infrastructure with near-complete data coverage. Meanwhile, the University of Montpellier, the University of Novi Sad, and the University of Palermo need to address significant gaps to improve their sustainability performance. This analysis provides a clear picture of where improvements can be made and serves as a valuable tool for guiding future efforts in energy management and sustainability.

Across all universities, utility billing records serve as a primary data source for monitoring electricity and heating consumption. Internal monitoring systems are also utilised, particularly by the University of Graz, the University of Alicante and Vilnius Gediminas Technical University, to provide detailed tracking and analysis. The responsible departments for data collection and monitoring vary, with facilities departments, directorates of resources and planning, and management of faculties playing key roles. Data is generally updated annually, although some universities, like the University of Graz, and Alicante update specific metrics monthly or even more frequently using digital platforms.

In terms of unmonitored KPIs, there are several areas where improvements can be made. For example, carbon intensity and energy intensity are critical metrics that need to be monitored by the University of Montpellier and the University of Novi Sad. Vilnius Gediminas Technical

University faces challenges in monitoring energy intensity due to the complexity of its infrastructure, while the University of Palermo needs to start tracking solar energy utilisation and waste heat utilisation. At the University of Alicante, carbon intensity is already tracked, but energy intensity and user-based efficiency indicators are not yet implemented. These have been identified as future development areas.

To strengthen energy performance monitoring and sustainability planning in HEIs, several detailed recommendations can be drawn from the analysis of current practices and data gaps.

- First, it is essential to establish standardised definitions and methodologies for energy KPIs. Currently, institutions use different metrics and formats, making comparison and benchmarking difficult. A unified framework should clearly define each KPI, such as how to calculate energy intensity or carbon emissions, and ensure consistency in units, reporting periods, and data granularity. This would allow institutions to align their reporting with national and international sustainability standards and facilitate collaborative research and policy development.
- Second, improving data collection infrastructure is critical. Many institutions rely solely on utility billing records, which are often infrequently updated and lack the detail needed for real-time analysis. Investing in smart metering technologies and integrated energy monitoring systems would allow for more frequent, accurate, and granular data collection. These systems should be able to collect data at the building or even room level, allowing for targeted energy efficiency measures and a better understanding of usage patterns.
- Third, filling existing data gaps must be a priority. Several campuses have incomplete records for key years or lack historical baselines, limiting their ability to track progress or evaluate the impact of energy-saving measures. Institutions should conduct audits to identify missing data and implement strategies to recover or estimate historical values where possible. Establishing protocols for regular data validation and archiving will also help maintain long-term data integrity.
- Fourth, the scope of monitored KPIs should be expanded to include critical but currently untracked indicators. These include carbon intensity, energy intensity, waste heat recovery, and emissions from commuting or remote work. Monitoring these KPIs requires working with external energy providers, installing new sensors, and in some cases developing new data models. However, their inclusion is essential for a comprehensive understanding of environmental impact and for achieving broader climate goals.
- To effectively expand the scope of energy metrics, universities need to move beyond technical upgrades and foster cross-departmental collaboration. Monitoring metrics such as carbon intensity, energy intensity, and commuter emissions requires input from a variety of units, such as sustainability offices, academic departments, human resources, and transportation planning. By forming cross-departmental teams, institutions can share responsibilities, align data collection efforts, and ensure that new metrics are both meaningful and manageable. This collaborative approach strengthens data quality and supports a more integrated and strategic approach to sustainability.

4. The proposed roadmap provides a strategic and flexible framework for aligning institutional sustainability initiatives with national and EU-level energy and climate objectives. Based on the

practices and insights of six European HEIs, it reflects diversity in institutional contexts and shared aspirations for sustainable transformation.

By structuring the roadmap into four phases — Assess, Plan, Implement and Monitor & Evaluate — the framework enables HEIs to go beyond mere compliance and transform national objectives into context-sensitive strategies and measurable outcomes. There is a particular focus on developing and using KPIs, especially integrating specific, impact-oriented indicators that reflect the institution's mission and capacity for sustainability leadership.

Crucially, the roadmap emphasises the importance of inclusive stakeholder engagement, capacity building and iterative learning. Through flexible implementation, it encourages institutions to strengthen internal coordination, increase the visibility of their sustainability efforts and foster a culture of accountability and innovation.

Ultimately, this roadmap enables HEIs to play a proactive role in national sustainability transitions, establishing them as key drivers of systemic change through evidence-based policy alignment and institutional action.

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