

**Workshop on Energy Statistics, Balances and Accounts for Informed  
Energy and Climate Policies.  
10-12 December 2024, Ankara, Türkiye**

**Current status of energy data in the ESCWA region**



Shared Prosperity **Dignified Life**



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UNESCWA ([Rouhanac@un.org](mailto:Rouhanac@un.org))**

# Outline

Why it is very important to collect data on energy

Current status of energy data: availability , gaps, and challenges in the ESCWA region

- Surveys (economic, household and other)
- Administrative data (electricity, customs)
- Reports of companies (importers and distributors)
  - Linking economic data (taxes, business registers for cross checking)
  - **Exploring additional sources**
  - Showcasing ESCWA's support in building statistical capacity

Detailed and Timely Energy data informs climate policies and SDGs

# Why Energy Data is Very important in Arab Countries

Economic Growth and Wealth

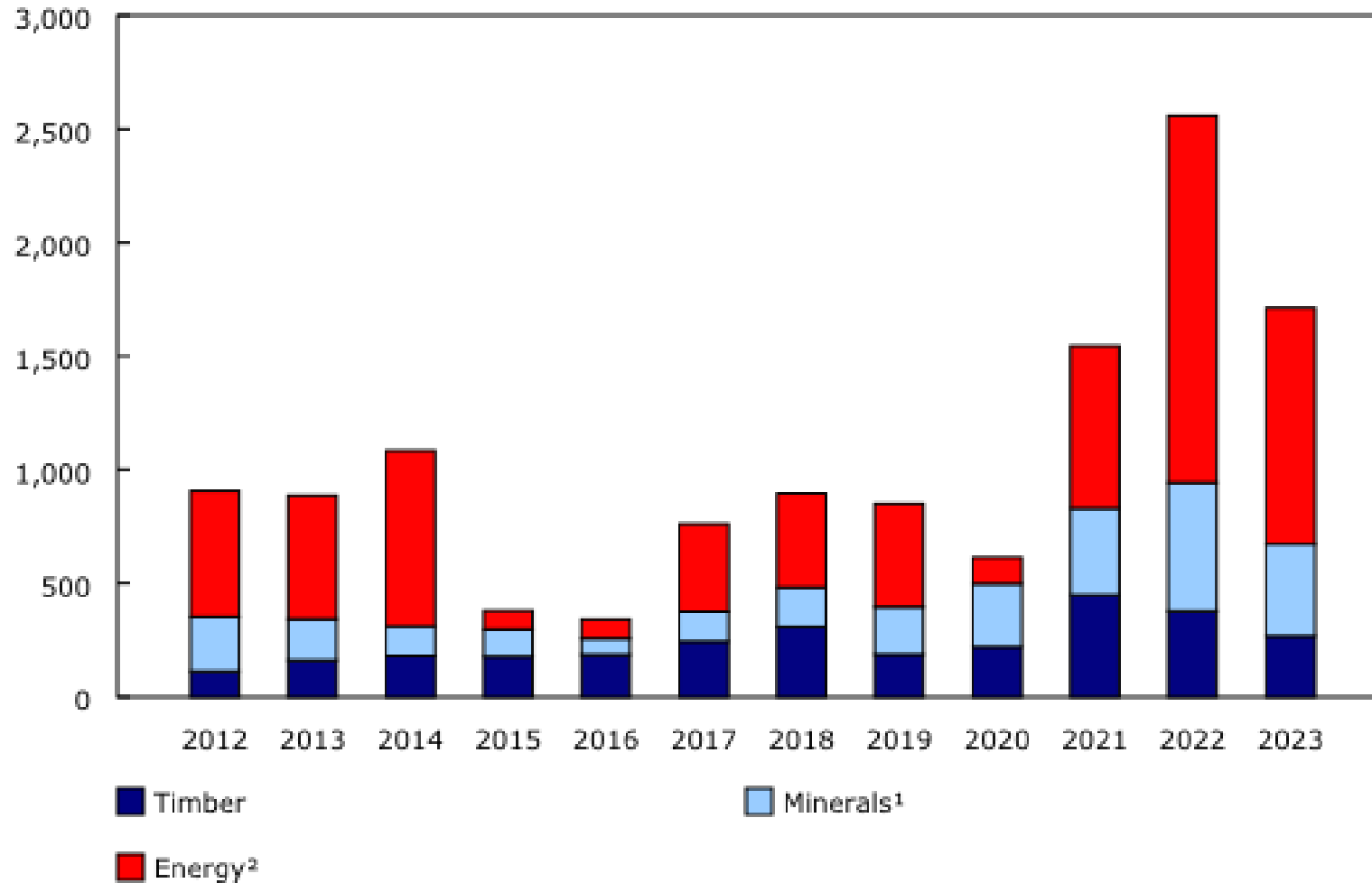
Climate and Environment

Social Wellbeing

Sustainable Development

# Canada's natural resource wealth, 2023

billions of dollars



**\$1,711 billion**

2023

**-33.1%**

(annual change)

Source(s): Table [3](#)  
[8-10-0006-01](#).

[Natural resource assets, 2012 to 2023](#)

# WHO COLLECTS? Main National Energy Data Sources in Arab Countries



## **National Statistical Offices (NSOs):**

Conduct energy-specific surveys such as household energy consumption and industrial energy use



## **Ministries of Energy, Environment, and Industry:**

Data on energy resources, production, consumption, and emissions.



## **Electricity Utilities production distribution and use by energy source , Oil and Gas Companies**



## **Customs imports/exports:**



## **Transportation: Fleets and mode of transportation**

# HOW THEY COLLECT

Surveys: Household energy surveys, industrial energy surveys, travel surveys.

Smart meters: Real-time energy consumption data at household and facility levels.

Billing data: Aggregated energy use data from utility companies.

Administrative records: Vehicle registration data, building permits, energy efficiency programs.

NEW Technologies in Energy Data Collection

- Smart and Advanced Metering Infrastructure (AMI)
- Remote Sensing and Satellite Imagery
- Internet of Things (IoT) and Smart Grids
- Big Data and Predictive Analytics
- Blockchain for Data Security and Transparency

Using International Statistical Standards and Classifications on Energy Statistics

Granular insights: consumer behavior and consumption patterns.

National Level, District and Household levels

# Key Data on Demand-Side



## Sectors:

Residential: Homes, apart, individual energy consumption patterns.

Commercial: Businesses, offices, retail, lighting, cooling, equipment.

Industrial: Manufacturing, production, heavy equipment,

Transport: Personal cars, public transportation, freight, fuel types, travel patterns.



## End-Use Categories:

Lighting: spaces, technologies and efficiency levels.

Heating and cooling

Cooking and appliances: Food, refrigerators, washing machines, electronics.

Industry-specific processes: Chemical reactions, production, material processing.



## Demand Drivers:

Socio-economic factors: Population growth, income levels, urbanization, lifestyle changes.

Technology: Efficiency improvements, new appliances, electrification trends.

Behavior: Energy awareness, conservation choices, consumer preferences.

# Insights on Data Availability

Some countries have nearly complete datasets, while others face challenges in data collection and reporting.

Disparity impacts the ability to analyze energy trends effectively at national and regional levels

## Challenges:

- Limited public access to energy data in some countries.
- Lack of standardized formats for data sharing.

Strengthening data collection efforts, particularly in renewable energy and emissions, will bridge these gaps.

Promoting open data initiatives and regional collaboration will enhance accessibility.





# Energy Balances and Accounts

Energy balances and accounts are essential tools for understanding national energy flows and their economic and environmental impacts.

## **Current Status in ESCWA Region:**

Several countries, including Morocco and Jordan, have established energy balances.

Integration with the SEEA framework remains limited, with ongoing efforts to harmonize data systems.

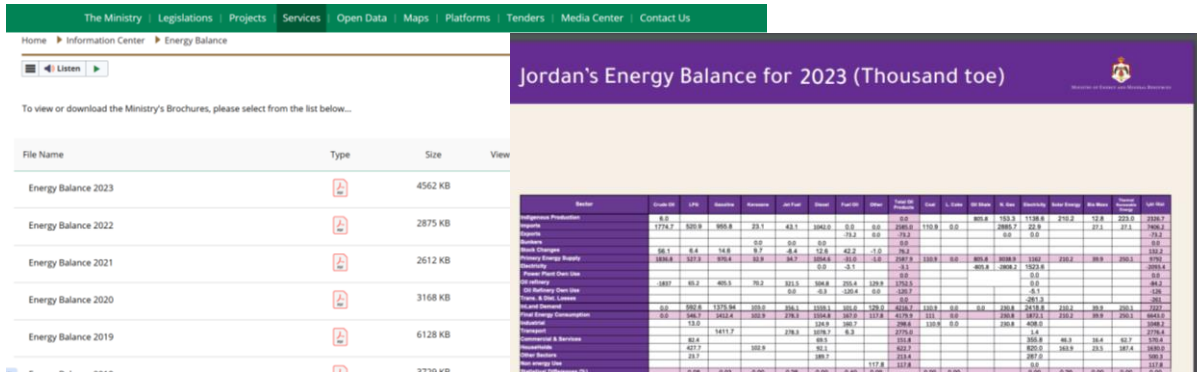
# Examples of National Energy data

## Egypt: Central Agency for Public Mobilization and Statistics (CAPMAS)



[https://www.capmas.gov.eg/Pages/IndicatorsPage.aspx?page\\_id=6132&ind\\_id=1180](https://www.capmas.gov.eg/Pages/IndicatorsPage.aspx?page_id=6132&ind_id=1180)

## Jordan [https://www.memr.gov.jo/En/List/Energy\\_Brochure](https://www.memr.gov.jo/En/List/Energy_Brochure)



## LEBANON-EDL

<http://www.edl.gov.lb/media/docs/%D8%A7%D9%84%D8%AA%D9%82%D8%B1%D9%8A%D8%B1%20%D8%A7%D9%84%D8%B3%D9%86%D9%88%D9%8A%202022.pdf.zip>

الاسم في الاتحاج	التطور النسبي 2022/2021 %	الطاقة المنتجة والمستهلكة (جيجا وات ساعة)		اسم المعسل أو جهة الاستيراد
		2021	2022	
البيطاني	42.15%	406.519	577.857	
نهر ابراهيم	-3.20%	82.606	79.967	
البارد (حتى 31 أيار 2022)	-18.72%	33.487	27.219	
مجموع المائي المتكثري	27.80%	536.035	685.043	
الصفلا مؤسسة	-	0.000	0.000	
البارد (استيراد البارد بتماماً من 1 حزيران 2022)	-32.33%	13.423	9.084	
القناديشا	-26.18%	38.285	28.261	
مجموع المائي العام	25.78%	574.320	722.388	
الترق	-88.60%	830.066	111.252	
الجبة	-91.67%	415.303	34.575	
مجموع البخاري	-88.29%	1,245.359	145.827	
الترق (مولدات عكسية)	-90.08%	549.320	54.476	
الجبة (مولدات عكسية)	-90.38%	258.469	24.871	
مجموع المولدات العكسية	-90.18%	807.789	79.347	
الترعاني	-42.37%	1,760.421	1,014.496	
نهر عصار	-50.48%	1,759.885	871.514	
مجموع الدائرة المغلقة	-46.42%	3,520.306	1,888.010	
بعلبك	-77.49%	24.057	5.415	
صور	-59.70%	53.243	21.458	
مجموع الغازي	-65.24%	77.300	26.873	
مجموع الغازي + دائرة مختلطة	-46.83%	3,597.606	1,912.883	
مجموع الحراري (مؤسسة)	-62.16%	5,650.754	2,138.057	
الحريرية	-	0.000	0.000	
مجموع الحراري العام	-62.16%	5,650.754	2,138.057	
طاقة من التوليد - الناعسة	-	0.000	0.000	
مجموع الطاقة من التوليد	-	0.000	0.000	
استيراد من سوريا	-	0.000	0.000	
استيراد من مصر	-	0.000	0.000	
الاولر التركية	-100.00%	1,208.382	0.000	
مجموع المؤسسة حراري + مائي	-62.00%	5,650.754	2,147.141	
مجموع قناديشا حراري + مائي	-26.18%	38.285	28.261	
مجموع قشراة: (مائي+سوري+مصري+الترعاني)	-60.73%	1,744.417	885.043	
المجموع العام السنوي	-61.52%	7,433.456	2,860.445	

For KSA: <https://open.data.gov.sa/en/home>

For Qatar: <https://www.data.gov.qa/pages/default/>

For Oman: <https://data.gov.om/>

OPEN DATA PLATFORM  
منصة البيانات المفتوحة

Home About Datasets Organizations APIs Community

energy

Length of distribution lines  
Created 19 hours ago  
Updated 19 hours ago · 2 Files  
XLSX (1) CSV (1)  
Ministry of Ene... 15 7

Length of transmission lines 2023  
Created 20 hours ago  
Updated 19 hours ago · 2 Files  
CSV (1) XLSX (1)  
Ministry of Ene... 5 3

Percentage of consumers consu...  
Created 20 hours ago  
Updated 19 hours ago · 2 Files  
XLSX (1) CSV (1)  
Ministry of Ene... 16 15

Electricity consumption Per con...  
Created 20 hours ago  
Updated 19 hours ago · 2 Files  
XLSX (1) CSV (1)  
Ministry of Ene... 10 8

Electricity consumption per con...  
Consumer numbers and energy ...  
The consumers electricity consu...  
Government Services for the En...

data.gov.qa  
منصة البيانات المفتوحة

Home About Catalog Map Builder Technical Links for Developers (API) Contact Us

Discover Qatar Open Data Portal

This open portal is a national data platform that indexes, tabulates, disseminates analysis and visualizes official statistics to facilitate their use. It should be noted that the data available on this platform are disseminated in full cooperation with partners' sources and can be circulated and used by all users of different interests, to be fully utilized.

Search datasets  
For example, 'Population' or 'Prices'

Qatar Monthly Statistics  
Period from January 2018 until September 2024

Population Price Index Trade

NATIONAL CENTRE FOR STATISTICS & INFORMATION  
Enhancing Knowledge SULTANATE OF OMAN

DATA PORTAL

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NCSI Home Who are we FAQ

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Data portal is a free and data-sharing portal where anyone can access data relating to the Sultanate of Oman. The Data Portal provides many datasets from different entities, for everyone - citizen, investor, researcher or developer. The Users can request for additional data sets here. Please do have a look around, and let us know what you think.

Search for data, statistics and visualizations

Data by Topics

Population National Accounts Housing Security Electricity More

Explore API v2.1 OAS3

The Opendatasets Explore API v2 is organized around REST. It provides access to all the data available through the platform in a coherent, hierarchical way.

- Only the HTTP GET method is supported.
- All API endpoints return JSON.
- Endpoints are organized in a hierarchical way describing the relative relationship between objects.
- All responses contain a list of links allowing easy and relevant navigation through the API endpoints.
- All endpoints use the Opendatasets Query Language (OQS). This means that, most of the time, parameters work the same way for all endpoints.
- While the reverse endpoint is subject to a limited number of returned records, the experts endpoint has no limitations.

Contact the developer

Authorize <https://www.data.gov.qa/api/explore/v2.1>

Catalog API to enumerate datasets

GET /catalog/datasets Query catalog datasets

GET /catalog/experts List expert formats

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Authentication

Every API call should pass authentication. There are 3 authentication options available:

- anonymous
- authentication via client\_id

Contact NCSI to provide you an additional information that you need to use in order to authenticate app. This information contains:

- App id
- App secret
- Authorize url
- Access token url

Authentication via client\_id

Application can authenticate itself by passing its application key via client\_id query string parameter or through Authorization header

GET [http://data.gov.om/api/1.0/meta/dataset/OMAGLS2016/dimension/Country?client\\_id=APP\\_ID](http://data.gov.om/api/1.0/meta/dataset/OMAGLS2016/dimension/Country?client_id=APP_ID)

OAuth authorization

Knoema uses OAuth 2 to provide authorized access to its API. It also support client and server side authentication flows.

## General Authority for Statistics (GaStat)

البواب « الإحصاءات المكتبية وإحصاءات الموارد » إحصاءات الطاقة « شدة إحصاءات الطاقة الكهربائية

أحدث تحديث 2023 / 09 / 20

شدة إحصاءات الطاقة الكهربائية

التحميل	جدولة التقرير	فترة التقرير	الاسم
		سنوي	2021
إحصاءات الطاقة الكهربائية 2021			

- الحسابات القومية
- الأسعار و الأرقام القياسية
- الاقتصاد الرقمي
- الصناعة والأعمال
- التجارة الدولية
- السكانية والجنسية
- الإحصاءات الاجتماعية
- الإحصاءات المكتبية وإحصاءات الموارد
- إحصاءات السياحة والحج والعمرة
- إحصاءات البيئة
- إحصاءات الزراعة
- إحصاءات الطاقة

شدة إحصاءات الطاقة الكهربائية

<https://www.stats.gov.sa/ar/1042>

<https://www.moenergy.gov.sa/en/DigitalDocument/s/OpenData/Pages/default.aspx> BROKEN LINK

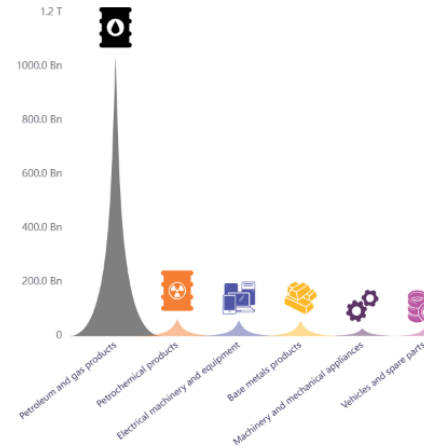
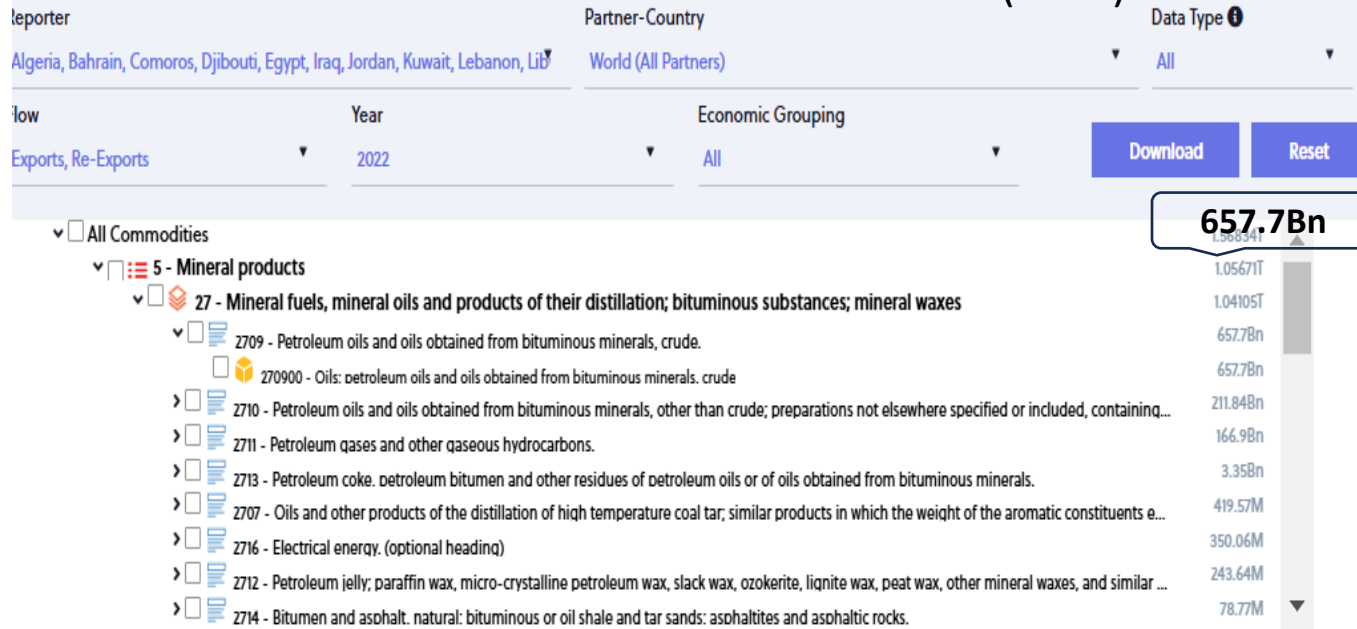
## How the Census-2022 Results Changed the Outlook for Electricity Demand KAPSARC 25 Nov 2024



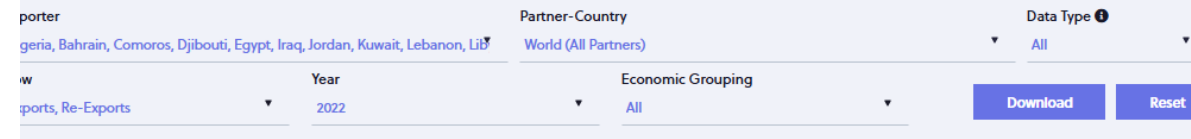
# ESCWA Arab Platform on Trade <https://etdp.unescwa.org/index.html>

## منصة بيانات التجارة الخارجية للمنطقة العربية

### ARAB SHARE in Trade 2022 in Petroleum oils and ..(2709)



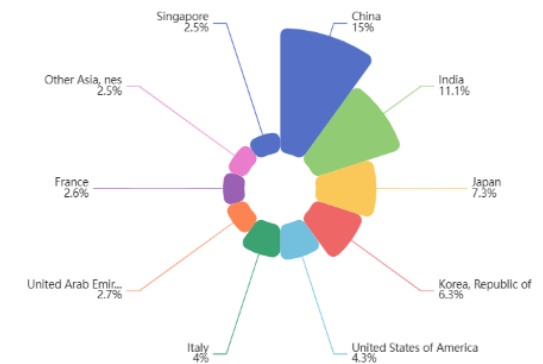
World Exports Comtrade Billions USD	\$960
Arab Exports	\$658
World Imports Comtrade	\$1,591
Arab Share of World Exports	68%
Arab Share of World Imports	41%
Difference in World Imports and Exports	\$631



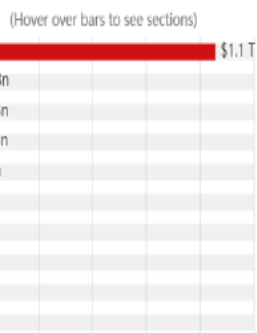
### Total Exports and Imports (USD)



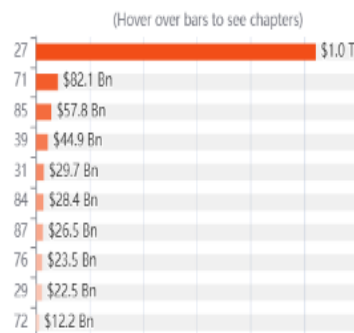
### Top 10 Trade Flow Partners



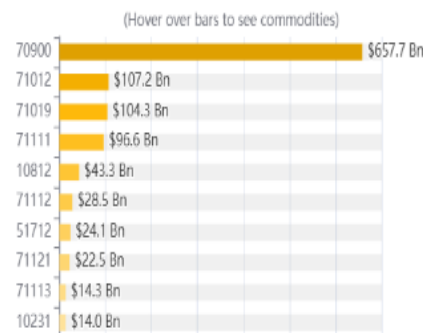
### Top 10 Sections



### Top 10 Chapters



### Top 10 Commodities



# ESCWA Project on Energy Surveys Sep 2014- July 2015

Demand Driven  
Agreement with 3 Countries  
Lebanon Declined



Funded by ISDB and DFID  
Implemented by ESCWA



previous Experience of  
Morocco and Tunisia who  
Shared Questionnaires and  
Experience

Coordination with  
national partners:  
Statistics,  
Transport, Energy,  
Planning,  
Environment on  
energy process and  
results

Technical  
assistance tailored  
to the needs of the  
countries on  
Statistical Survey

Better  
Information on  
Energy Use in  
Transport by  
mode and  
vehicle type and  
by product

Workshop and  
trainings  
methodological  
documents

Enhanced  
regional  
coordination  
networking and  
knowledge  
sharing Egypt,  
Jordan Palestine  
with Tunisia and  
Morocco

# Comparative Results

Palestine Survey Results 2014	Liters Gasoline كمية البنزين لتر	Liters Diesel كمية السولار لتر	Total Fuel Terajoules اجمالي الوقود بالتيراجول	Total Fuel TOE طن مكافئ نفط
Road				
6. إجمالي استهلاك الوقود بالتر حسب نوع الوقود لمركبات الركاب 2014	261,872,905	321,781,503	20,623	492,562
7. إجمالي استهلاك الوقود بالتر حسب نوع الوقود لمركبات نقل البضائع 2014	9,014,661	309,777,305	11,884	283,852
<b>Total</b>	<b>270,887,566</b>	<b>631,558,808</b>	<b>32,507</b>	<b>776,414</b>

Palestine Energy Balance 2013

455,000

8% increase from 2013

## 2014 Jordan Survey Results

In TOE

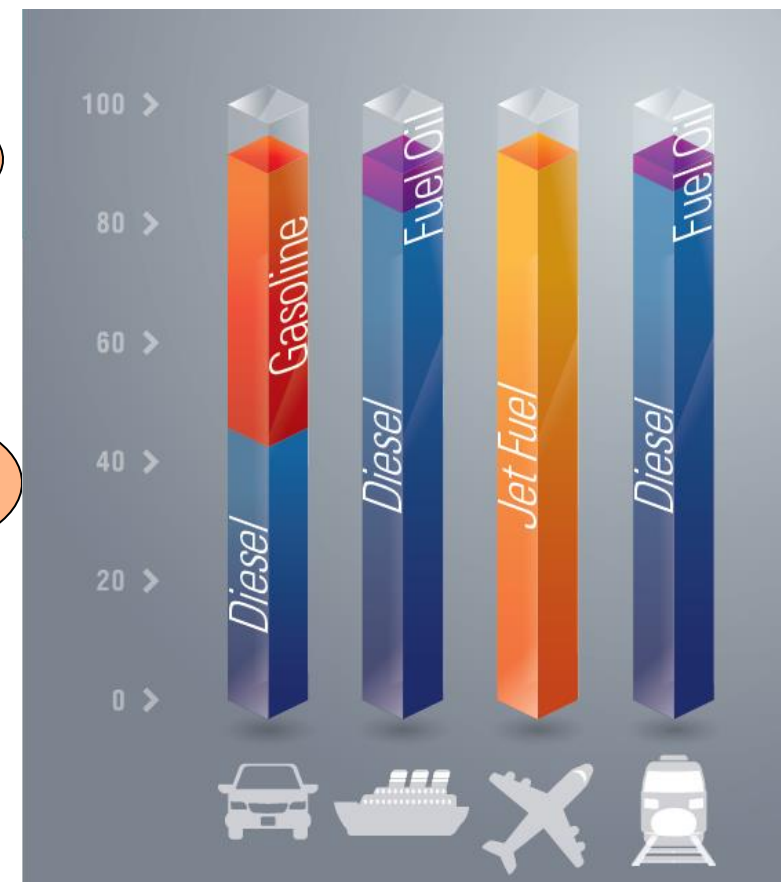
Road	Gasoline	Diesel	Fuel Oil %	Jet Fuel %	
Energy Use by Road Transport of Passengers	1,707,434	253,839	0.03	9.22	1,961,273
Energy Use by Road Transport of Merchandise	10597.71	1,155,171			1,165,769
Other Modes Passengers (Rail and Air)					3,092
Other Modes Merchandise (Rail and Air)					17,756
<b>Total Energy Use by Transport</b>					<b>3,147,890</b>

15% increase from 2013

	Gasoline	Diesel	Fuel Oil	Jetfuel	Total
<b>Jordan Energy Balance 2010 in 000 tons</b>	1,109	630	7	245	1,991
<b>Jordan Energy Balance 2013 in 000 tons</b>	1243	1117.8	4.4	368.5	2,733.7

In Egypt, total transport sector petroleum energy consumption increased from  
 ??? Ktoe in 2014/2015??  
 11,187 ktoe in 2012/2013  
 10,646 ktoe in 2010/2011

7% increase





# ESCWA's Support: WORKSHOPS ON ENERGY STATISTICS, BALANCES, AND ACCOUNTS

- Regional Workshops and TOTs
  - UNSD ESCWA, SESRIC, and IEA -Workshop on Energy statistics, balances and accounts for informed energy and climate policies 10-12 December 2024 Ankara, Türkiye,
  - IEA October online training 28th Energy Statistics Course - Event - IEA
  - Training for trainers on Energy Statistics and Balance GCCSTAT – ESCWA – IEA – UNSD Oman 9-13 MARCH 2014
  - Training Workshop on Energy Statistics and Energy Balance for ESCWA Countries Abu Dhabi 17-21 FEBRUARY 2013

## National Workshops and Technical Assistance

- UNSD/ESCWA Technical Assistance to Lebanon on Improving Energy Statistics for Sustainable Development Lebanon 2-5 JULY 2019
- Sudan, Egypt, and others



# Materials ON ENERGY STATISTICS, BALANCES, AND ACCOUNTS

• التوصيات الدولية لإحصاءات الطاقة

• (SEEA) دورة عن الطاقة في نظام المحاسبة

• الاقتصادية البيئية

• Training manual on methodologies for data  
collection on energy use by the transport  
sector

• دليل إحصاءات الطاقة

• [https://unece.org/sites/default/files/2023-10/UNFC ES61 Update 2019.pdf](https://unece.org/sites/default/files/2023-10/UNFC_ES61_Update_2019.pdf)

• <https://www.unescwa.org/publications/arab-trade-2023-trends-highlights>

• <https://unstats.un.org/unsd/energystats/questionnaire/documents/Quest-2022-A.xlsx>

• <https://etdp.unescwa.org/index.html>

# Informing Climate Policies

Reliable energy data is fundamental for effective climate policies.

## Connections to Policy:

- **SDG 7:** Monitoring progress toward affordable and clean energy.
- **SDG 13:** Tracking emissions and supporting climate resilience.
- **Nationally Determined Contributions (NDCs):** Aligning energy data with targets under the Paris Agreement.
- **SDG 1.5.1. 1.5.2 11.5.2.11.5.3. Disaster Risk Management**

**Examples:** Jordan: Expansion of solar energy projects informed by data.

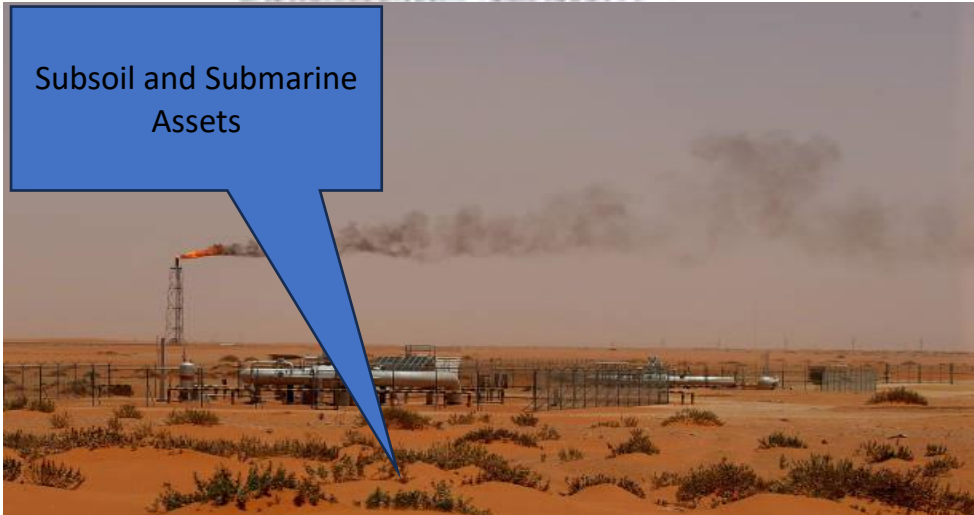
- Egypt: Monitoring emissions reduction to meet climate targets.

# Supercharging development with decarbonization and need for detailed Energy Data

Solar+ Wind Energy  
Sink



Subsoil and Submarine  
Assets



- Decarbonization is a huge opportunity for Arab and MENA to:
- Supercharge development and boost economy
- Business opportunities for fast-growing industries and MSMEs leading transition but this may require the formation of clusters of firms that overcome some of the constraints that their limited size could involve.
- Job creation and opportunities
- New export lines
- Carbon Footprint Reduction and net zero

Towards a productive, inclusive and green economy in MENA ERF by [Atif Kubursi](#) Nov 05, 2024

# Arab Trade Opportunities in Green technology

## Arab trade in 2023: trends and highlights



Shared Prosperity Dignified Life



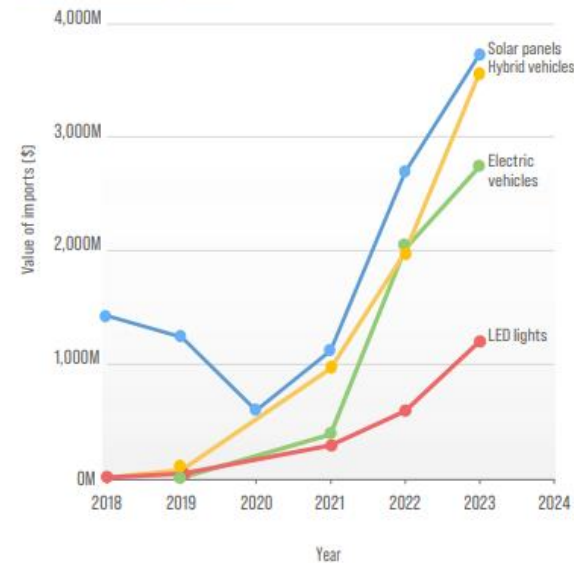
E/ESCWA/CL4.SIT/2024/Policy brief.1



## Trade in green technology products

Following global trends and market needs, recent trade statistics in the Arab region suggest an increasing preference for importing green technology products such as solar energy related products, electric vehicles (EVs), and energy-efficient light-emitting diode (LED) lighting solutions. These green technologies diminish waste and emissions, conserve resources through enhanced energy efficiency, and promote sustainable consumption practices.

**Figure 9. Green imports: a comparison of hybrids, EVs, LEDs, and solar panels**

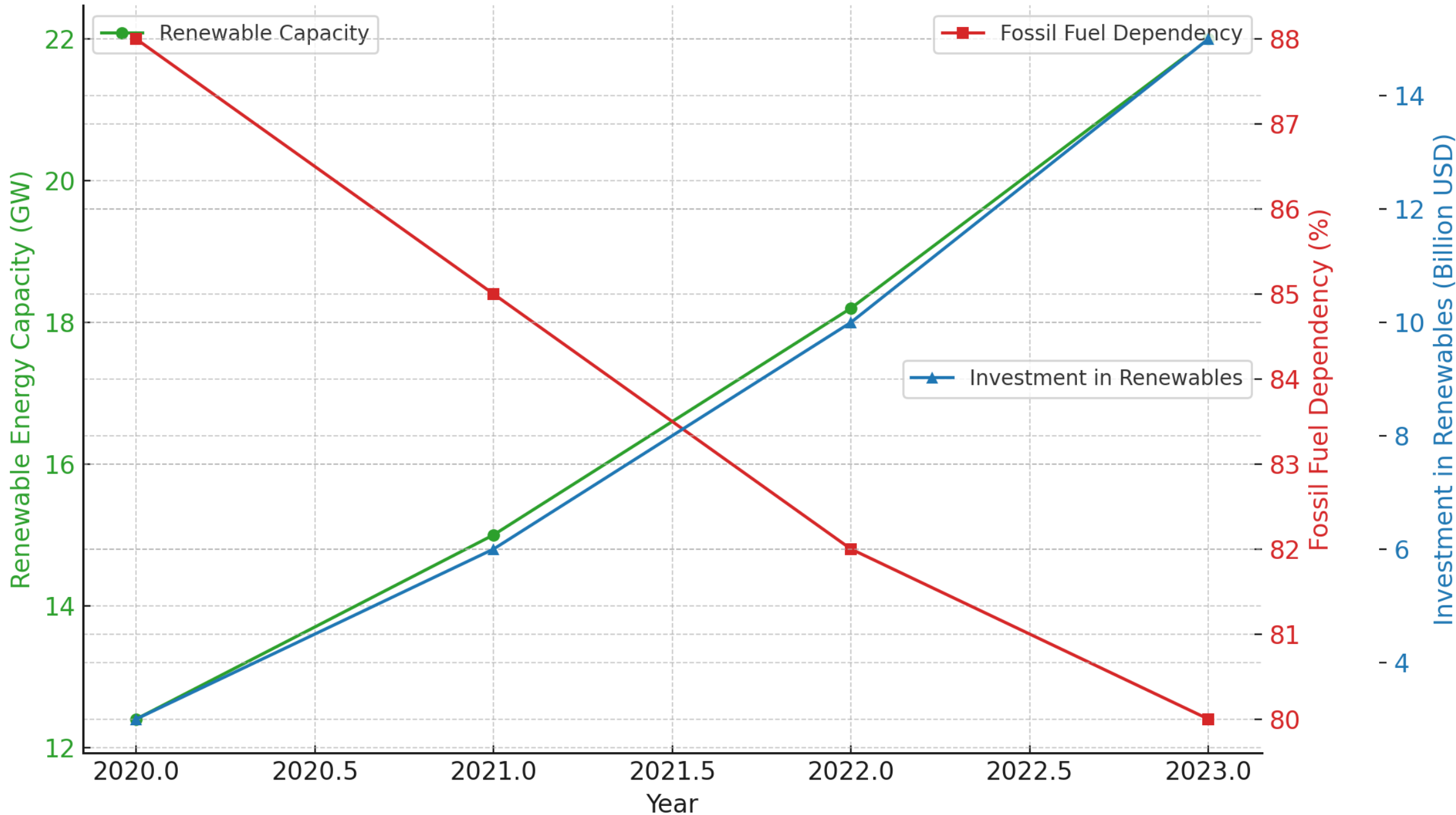


Since 2012, there has been a continuous upward trend in the importation of solar panels in Arab countries. Following a decline in 2020, import figures surged by approximately 500 per cent in subsequent years, culminating in a record high of \$3.7 billion in 2023. The imports values of LED lights have been steadily rising, exceeding \$1.2 billion in 2023.

Both hybrid and EV imports have witnessed significant growth since 2018. In 2023, hybrid vehicle imports saw a remarkable 80 per cent surge, reaching \$3.6 billion. EV imports also climbed in 2023, reaching \$2.7 billion, reflecting a 36 per cent increase.

China accounted for 55 per cent of all electric cars imported by Arab countries, with the United States of America and Germany following with 14 per cent and 13 per cent, respectively. Additionally, China emerged as the primary supplier of solar panels to the Arab region, with its share exceeding 90 per cent. The imports of hybrid vehicles, however, are led by Japan with a share of 28.5 per cent, Germany with 26.2 per cent, and the United States with 10.2 per cent. The trend is expected to gain momentum in the coming years.

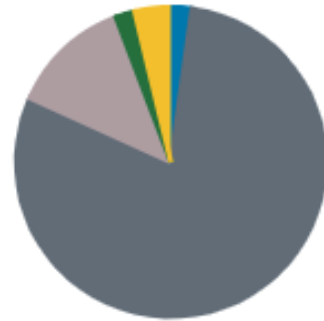
# Energy Trends in the Arab Region (2020-2023)



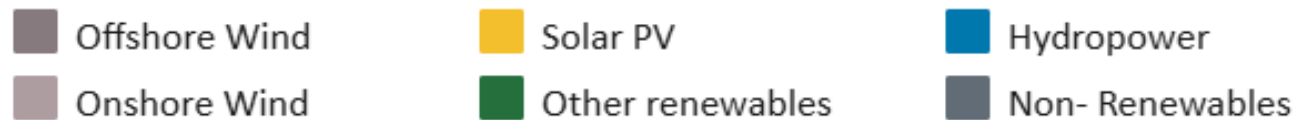
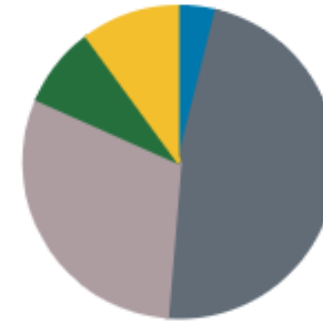
# MENA Transition Trends

## Shares 2050 (%)

Planned Energy Scenario



Transforming Energy Scenario



*\*2018 for World and 2017 for the all other regions.*

**Source** IRENA (2021), World Energy Transitions Outlook: 1.5°C Pathway, International Renewable Energy Agency, Abu Dhabi <https://www.irena.org/publications/2021/Jun/World-Energy-Transitions-Outlook> and IRENA (2020), Global Renewables Outlook: Energy transformation 2050, International Renewable Energy Agency, Abu Dhabi

# New Data Sources for Solar Energy

Estimation to fill gap

disaggregated data



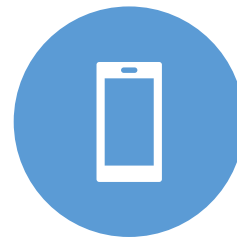
SATELLITE  
IMAGERY



WEATHER DATA



IOT DATA



SOCIAL MEDIA  
DATA



CROWDSOURCED  
DATA

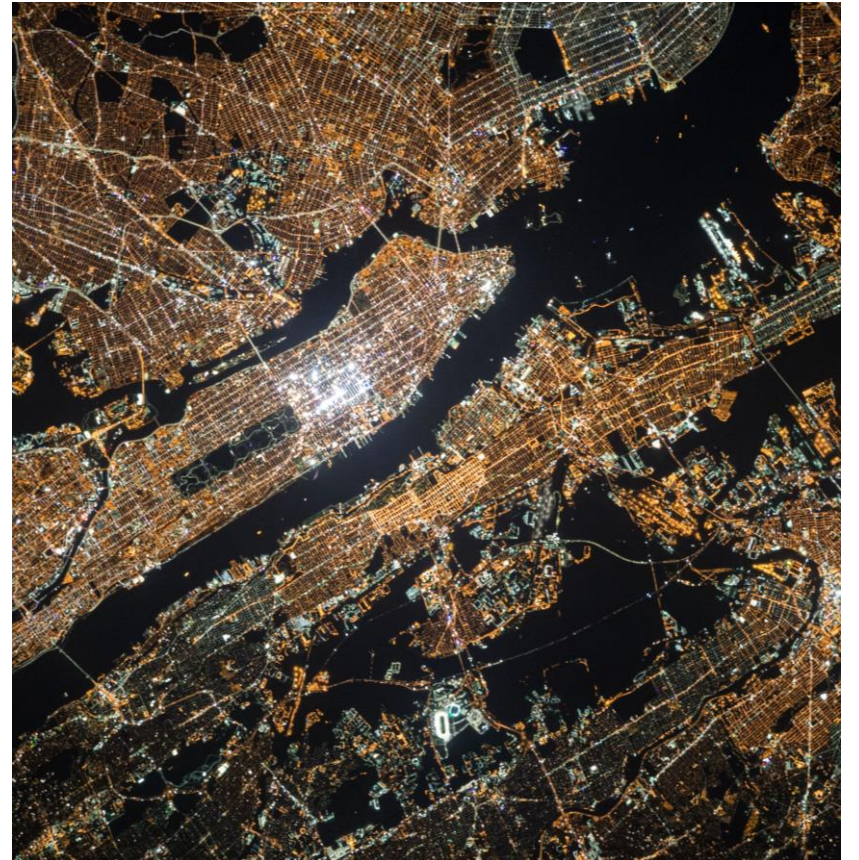
# Benefits of Using New Data Sources

Increased accuracy and timeliness of estimates

Reduced costs of data collection and processing

Ability to estimate solar energy potential at a more granular level

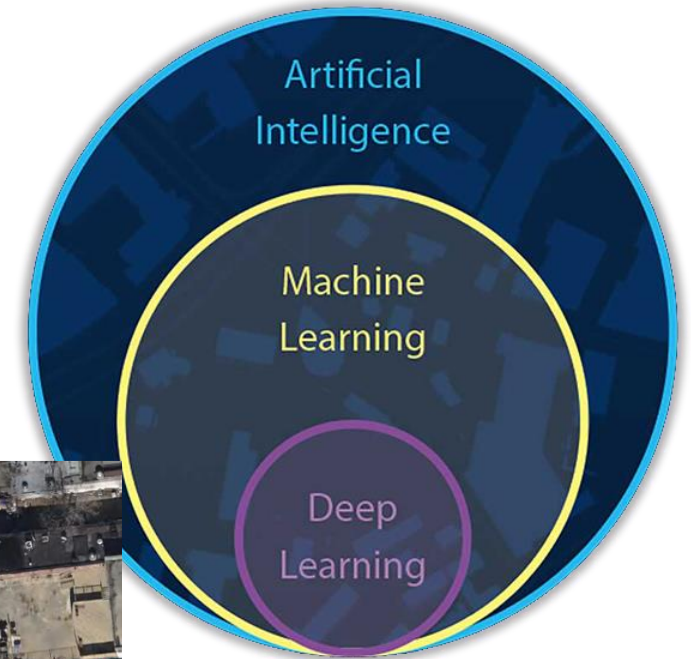
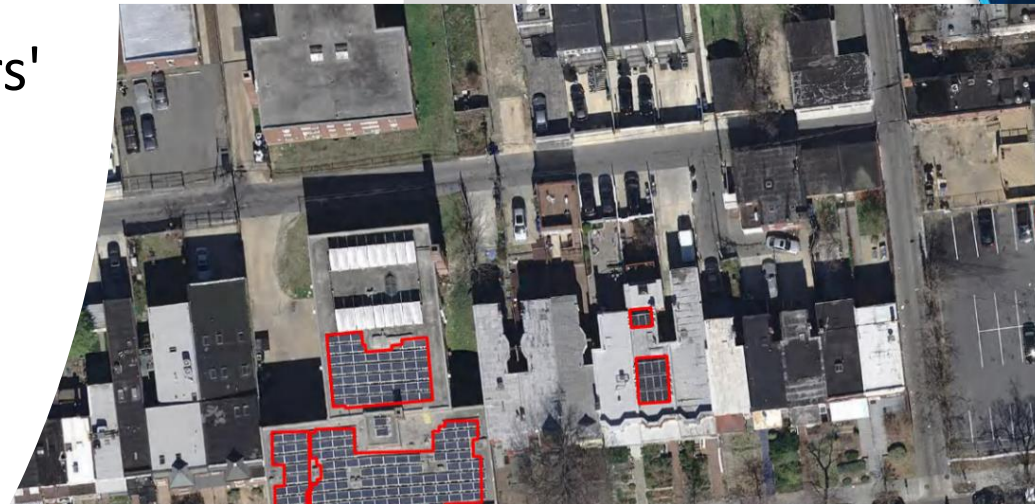
Improved understanding of the impact of solar energy on the grid and the environment





# ESCWA Project DA 17: Improved Mapping and Monitoring of Solar Energy Access

- 3 Beneficiary Countries
- Train government officials on using machine learning and geospatial tools.
- Strengthen policymakers' ability to develop evidence-based solar energy policies.



# Benefits of the Solar Panel Detection

**Accurate and efficient solar panel detection**

**Scalable to large areas**

**Cloud-based and easy to use**

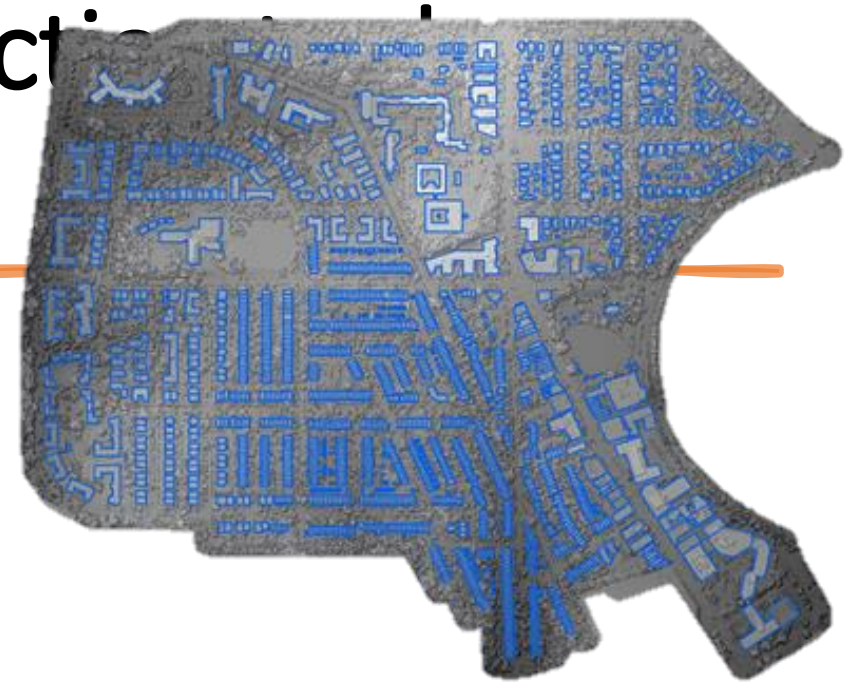
**Can be integrated with other GIS software**

**Data-Driven Planning**

**Cost-Effective**

**Complementarity and Integration with Household Surveys**

**Production a variety of outputs, maps of solar panel locations  
estimates of the total solar panel capacity and energy potential in a gi**



# Challenges

The use of new data sources for estimating solar energy data presents a number of challenges, including:

Computational requirements

Data privacy and security

Data quality and consistency



## Conclusion and Way Forward

### Key Takeaways:

- Reliable energy data underpins sustainable development and climate action.
- ESCWA plays a crucial role in supporting member states through capacity-building, methodology development, and regional coordination.
- Addressing data gaps and leveraging new technologies will enhance energy statistics across the region.

### Call to Action:

Strengthen collaboration among national stakeholders in member states to build robust, accessible energy data ecosystems for a sustainable future.