Module 14. Good and best practices for releasing the data

Workshop on the Strategic Framework for the African Bioenergy Data Management

Agnieszka Koscielniak, Energy Statistics Section

Lomé, Togo

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Outline

- Introduction
- Disseminations and data users
- UNSD solutions
- Charts - the basics of visualization
- Examples of charts
- Storytelling with charts
- Conclusion
Introduction
Dissemination policy

“The dissemination policy should be user oriented, reaching and serving all user groups (central government, public organizations and territorial authorities, research institutions and universities, private sector, media, general public, international users), and provide quality information.”

Role of official statistics agencies in dissemination

- Provide impartial information to government and citizens
- Present information according to scientific standards
- Are entitled to comment on erroneous interpretation and misuse of statistics

Disseminations and data users
Data dissemination strategies

- Adopting a user-oriented dissemination policy:
  - Data awareness (existing datasets, release calendar, newly available datasets)
  - Data access (freely available, easy to find, user friendly access)
  - High quality data (quality control, clear methodology, units, definitions)

- Harmonization data with international standards and provide metadata.

- Providing contact point for data requests.

- Adapting format to take into account the diversity of users.
Users (or potential users) interest and technical expertise

Policy makers
- Interest: ?
- Technical knowledge: ?

Programme, project managers
- Interest: ?
- Technical knowledge: ?

Analyst, modelers, researchers
- Interest: ?
- Technical knowledge: ?

General audience, students, journalist
- Interest: ?
- Technical knowledge: ?

What are their interests and technical knowledge? What are their data needs?
Users interest and technical expertise

Policy makers
- Interest: inform their decisions based on findings
- Technical knowledge: Fundamental

Programme, project managers
- Interest: monitor and evaluate projects
- Technical knowledge: Associate

Analyst, modelers, researchers
- Interest: replicate or continue project
- Technical knowledge: Expert

General audience, students, journalist
- Interest: to understand the general results and impacts
- Technical knowledge: Novice or generalist

Visualization tools and interactive charts help non-experts extract information from data.
“[...] Countries are encouraged to work closely with the user community by conducting vigorous outreach campaigns, including building stable and productive relationships with users and key stakeholders, for example, inviting interested users to become standing customers, actively helping users to find the statistical information they need and assisting them in the understanding of the role of energy statistics in sound decision making.”

United Nation (2012), International recommendations for Energy Statistics, 10.3
UNSD outputs - before

Statistics database extract
- One line per one datapoint
- Codes to describe product, country, flow, unit
- Accompanied by file with codes explanation
- Requires data manipulation and transformation techniques

Technical knowledge: Expert

UN data portal
- Data sharing tool
- Allows users to browse to different combinations of flows for one product for many countries
- Not users friendly

Technical knowledge: Associate

Legacy publications
- Present some aggregates and charts
- Mostly data tables
- Statistics for last 4 years (with few exceptions)
- Balances for last 2 years, without regions or world

Technical knowledge: Associate
**UNSD outputs – added outputs**

**Data portal**
- Technical knowledge: Novice or generalist, and others
- Balances by country from 1990
- Dashboards with key charts, sankey diagram, balances tables
- Allows user to download data behind

**Dashboard**
- Technical knowledge: Novice or generalist
- Simple excel
- To complement data portal with data aggregated by subregion, region and world level

**Pocketbook publication**
- Technical knowledge: Novice or generalist
- Presents data highlights in more visual way, including maps

**API**
- Technical knowledge: Expert
- For energy statistics and energy balances country
- Allows advance users to automatically grab the data from the website

All developed inhouse!
Energy Balance Visualization

Select a Country: Togo

Trends | SanKey | Energy Balances | About

Flow | Time Period
Total Energy Supply | All

Total Energy Supply by Fuel

Unit: Terajoules

Final Consumption

Unit: Terajoules

Consumption Sector | Time Period
Final Consumption | All


Oil Natural Gas Biofuels Waste Electricity Heat

Manufacturing Transport Agriculture Other Consumers Non-energy Use Commerce Household
### FACTS AND FIGURES

In 2020, total electricity generation was 75.8 PWh, slightly decreasing compared to 2019 (76.4 PWh), overall, electricity from renewable sources kept increasing in 2020 – for example, solar grew by 20.6% and wind by 11.9% - while electricity generated from thermal sources declined by 2.5% compared to 2019. 

In the long run, electricity increased by 2.0% between 1990 and 2020: the largest absolute growth was observed for electricity generated from coal (5,022 TWh or +11.3%) and natural gas (4,619 TWh or +25.8%), while the fastest growth was visible for electricity generated from solar, wind and other sources (4,4067 or 2,501 TWh). In 2020, 73.3% of all electricity was generated from non-renewable sources, mainly from non-renewable thermal (61.9% or 16,003 TWh) and nuclear sources (10.6% or 2,674 TWh). However, renewable electricity accounted for 17.2% of global electricity capacity additions over the last decade, growing to 2,529 GW in 2020 and reaching 37.5% at total electricity capacity.

### Table: Total electricity generation by region, 1990, 2000, 2010 and 2020

<table>
<thead>
<tr>
<th>Region</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>311.6</td>
<td>437.3</td>
<td>677.6</td>
<td>848.0</td>
</tr>
<tr>
<td>Northern America (excl. US)</td>
<td>82.9</td>
<td>606.6</td>
<td>604.3</td>
<td>651.3</td>
</tr>
<tr>
<td>United States</td>
<td>3,218.6</td>
<td>4,052.7</td>
<td>4,378.4</td>
<td>4,260.0</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>24.6</td>
<td>1,010.6</td>
<td>1,405.8</td>
<td>1,610.0</td>
</tr>
<tr>
<td>Asia (excl. China)</td>
<td>1,417.5</td>
<td>3,392.2</td>
<td>5,091.1</td>
<td>6,652.9</td>
</tr>
<tr>
<td>China</td>
<td>61.2</td>
<td>1,355.6</td>
<td>4,207.2</td>
<td>7,779.1</td>
</tr>
<tr>
<td>Europe</td>
<td>4,171.5</td>
<td>4,386.8</td>
<td>4,913.7</td>
<td>4,690.2</td>
</tr>
<tr>
<td>Oceania</td>
<td>192.8</td>
<td>257.9</td>
<td>308.1</td>
<td>322.1</td>
</tr>
<tr>
<td>World</td>
<td>11,170.7</td>
<td>15,503.8</td>
<td>21,586.9</td>
<td>26,816.9</td>
</tr>
</tbody>
</table>
Charts - the basics of visualization
Trends

Simple line chart – presents how a numeric variable changes over time

Multi-line chart – compares multiple numeric variables over time

Stacked area chart – used to track breakdown of a numeric variable over time
Relationships

Bar chart/Column chart – comparison of categorical data

Scatter plot – shows a relationship between two variables

Bubble chart – used to visualize data points with 3 dimensions, with size of the bubble
Part of a whole

Pie chart/donut pie chart – to show part of the whole data or percentages

Stacked column chart – used to compare subcategories within categorical data
Flows

Sankey diagram – represents flow in the system

Dependency wheel (chord chart) – presents weighted relationships of flows between nodes
Colors – hue, chroma and luminance (HCL)

Choice of colors is crucial for data visualization.

HCL is a color schema where each color within the HCL color space is defined by a triplet of values:

- **Hue**: defines the color,
- **Chroma**: defines the colorfulness (intensity of color as compared to gray),
- **Luminance**: defines the brightness.

Example showing how one property can vary while keeping the other two properties fixed.
Qualitative palette

- Data type: qualitative
- Purpose: distinguish unorder data
- Different hue

CO2 emissions from fuel combustion
Sequential palette

- Data type: sequential
- Purpose: showing order
- Different chroma or luminance

1. Total energy supply per capita, 2019
Gigajoules per capita
Diverging palette

- Data type: diverging
- Purpose: showing above or below a midpoint
- Different chroma or luminance, with 2 hues
Ready to use palettes

Many websites provide automatic color palette generators as well as testing your choice of colors color vision deficiencies (recommended for all visuals!).

Base Options
Type of palette
Basic: Diverging

Base color scheme
Blue-Red

Example
Map

Palette Creator
»Design your own color palette based on HCL principles.«

Deficiency Emulator
»Do your figures work for viewers with color vision deficiencies?«
Examples of charts
Good chart is easy to understand

Poland, total energy supply, terajoules
Which fuel has the biggest share?

World total energy supply, 2020
Using 3D – pie chart example

World total energy supply, 2020

- Biofuels and waste: 9%
- Coal: 28%
- Oil: 28%
- Natural Gas: 5%
- Nuclear: 5%
- Electricity and heat: 25%
Switching to 2D – pie chart example

World total energy supply, 2020

- Coal: 28%
- Oil: 28%
- Natural Gas: 25%
- Biofuels and waste: 9%
- Nuclear: 5%
- Electricity and heat: 5%
What was the percentage of households owning fridge-freezer in 1980?
World total final consumption by fuel, 2015

- Anthracite
- Sub-bituminous coal
- Coke oven coke
- BKB
- Blast furnace gas
- Peat products
- Municipal waste (renew)
- Biogases
- Other liquid biofuels
- Crude oil
- Ethane
- Aviation gasoline
- Kerosene
- Naphtha
- Bitumen
- Non-specified oil products
- Electricity
- Coking coal
- Lignite
- Gas coke
- Gas works gas
- Other recovered gases
- Oilshale and oil sands
- Municipal waste (non-renew)
- Biogasoline
- Charcoal
- Natural gas liquids
- Liquefied petroleum gases
- Gasoline type jet fuel
- Gas/diesel oil excl bio
- Kerosene type jet fuel
- Fuel oil
- White spirit
- Paraffin waxes
- Geothermal
- Heat
World total final consumption by fuel, 2015

- Coal: 3%
- Oil: 41%
- Natural gas: 19%
- Combustible renewables and waste: 11%
- Geo- & Solar thermal: 15%
- Electricity: 0%
- Heat: 11%
How the data could be presented in more readable format?

Number of people without electricity, 2006 (million)

Source: IEA, Access to electricity
**Number of People without electricity, 2006 (million)**

<table>
<thead>
<tr>
<th>Region</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>110</td>
<td>443</td>
<td>553</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>109</td>
<td>439</td>
<td>548</td>
</tr>
<tr>
<td>North Africa</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Developing Asia</td>
<td>145</td>
<td>822</td>
<td>966</td>
</tr>
<tr>
<td>East Asia and China</td>
<td>39</td>
<td>189</td>
<td>228</td>
</tr>
<tr>
<td>South Asia</td>
<td>88</td>
<td>650</td>
<td>739</td>
</tr>
<tr>
<td>Middle East</td>
<td>17</td>
<td>25</td>
<td>42</td>
</tr>
<tr>
<td>Latin America</td>
<td>7</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>Developing Countries</td>
<td>248</td>
<td>1,342</td>
<td>1,590</td>
</tr>
<tr>
<td>OECD and transition economies</td>
<td>&lt;1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>World</td>
<td>284</td>
<td>1,339</td>
<td>1,623</td>
</tr>
</tbody>
</table>

Source: IEA, Access to electricity
Example of using bar chart

Vertical bars

Electricity consumption in 2020, kWh per capita

Africa  Côa d’Ivoire  DR Congo  Eswatini  Ethiopia  Kenya  Mozambique  Nigeria  South Africa  Togo  Tunisia  Uganda
Example of using bar chart

Vertical bars

Sorting by values

Electricity consumption in 2020, kWh per capita

Africa
Multiple charts

World total energy supply by source, exajoules

World total energy supply by source, 2020
Multiple charts

World total energy supply by source, exajoules

World total energy supply by source, 2020

World total energy supply by source, exajoules
Storytelling with charts
Example: clean cooking in sub-Saharan Africa

Source: SDG7 Tracking progress report

The access deficit in sub-Saharan Africa rose by more than 50 percent since 2000 to 923 million in 2020.
Example: Switch from fuel oil to gas diesel in international marine bunkers in 2015

Deliveries to international marine bunkers in OECD Europe shifts from fuel oil to gas diesel oil as the result of new legal requirements related to changes in the sulfur content in Sulfur Emission Control Areas.

Source: IEA, Key oil trends, 2015
The electricity sector continues to see the fastest progress: the share of renewables in that sector increased from 19.7 per cent in 2010 to 26.2 per cent in 2019.
Renewables uptake is uneven across end uses, the greatest urgency is needed heat and transport end uses.

Source: REN21, Renewables global status report 2023 collection
Conclusion
Dissemination of statistics

- Tabular data, useful for many users, maybe difficult to understand.
- Charts are powerful way of conveying messages.
- Best charts are charts easy to understand.
- There is a virtuous circle between data quality, dissemination and use.
Thank you.

Contact
UNSD – Energy Statistics Section
Energy_stat@un.org