Energy Statistics at the 2018 G20

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16th APEC Workshop on Energy Statistics, Tokyo, 10th – 12th
July 2018

G20 Energy End-Use Data and Energy Efficiency Metrics initiative

The G20 end-use data and energy efficiency metrics initiative

- Agreed by G20 in Beijing to launch a new work stream on *Energy End-Use Data and Energy Efficiency Metrics* within the Energy Efficiency Leading Programme, June 2016

- Work to be led by France (ADEME) and the IEA, with voluntary participation of G20 members

- First workshop held in Paris, December 2016
  http://www.iea.org/workshops/g20-energy-end-use-data-and-energy-efficiency-metrics-initiative.html

- Draft ToR circulated in March 2017; agreed in July 2017

- Second workshop: 22 February under Argentina G20 Presidency, followed by 23 February in-depth technical workshop

G20 initiative: Objective and work areas as identified in ToR

To provide a forum for participating countries to **share experience in collecting/using energy efficiency data for policy making**

Three main areas identified:

- **Technical**
  Sharing information on various topics such as data collection; mobilisation of partners, and links between modelling and data

- **Communication**
  Strengthening the ability to explain data and indicators to policy makers, business and the public to maximise their impact.

- **Wider outreach**
  Discussing how to ensure that efficiency goes hand in hand with greater energy access in developing economies.

G20 Energy End-Use Data and Energy Efficiency Metrics initiative Second meeting: 22nd February 2018, CCK, Buenos Aires

- Introduction – Framework and goals of the initiative
- Why Policy makers need better data
- What data are needed?
- Developing the data – barriers and opportunities
- International cooperation – next steps.

Ten countries contributed to the workshop: Argentina, France, Mexico, the UK, Brazil, Germany, Italy; plus China, Korea and the United States – the latter sharing presentations despite not being able to physically attend (Roberta and Mafalda presented for them) along with three international organisations (IEA, IPEEC, OLADE)

Conclusions

- G20 countries confirmed their strong interest in a knowledge-exchange platform around end-use energy data and energy efficiency metrics, with the overall objective of enhancing data for energy efficiency policy.

- Interest from major players from across the world proved that this multilateral initiative on data has a great potential to strengthen data knowledge across leading countries, despite their differing energy demand patterns and trends

- Information exchange would be beneficial, such as: data gaps identification; methodologies for end-use data collection; potential of emerging technologies for end-use data gathering; methodologies for energy efficiency indicators

- Enhanced regional collaboration involving G20 countries and beyond, such as that through ECLAC and OLADE in Latin America, would be beneficial to the advancement of end-use data, globally

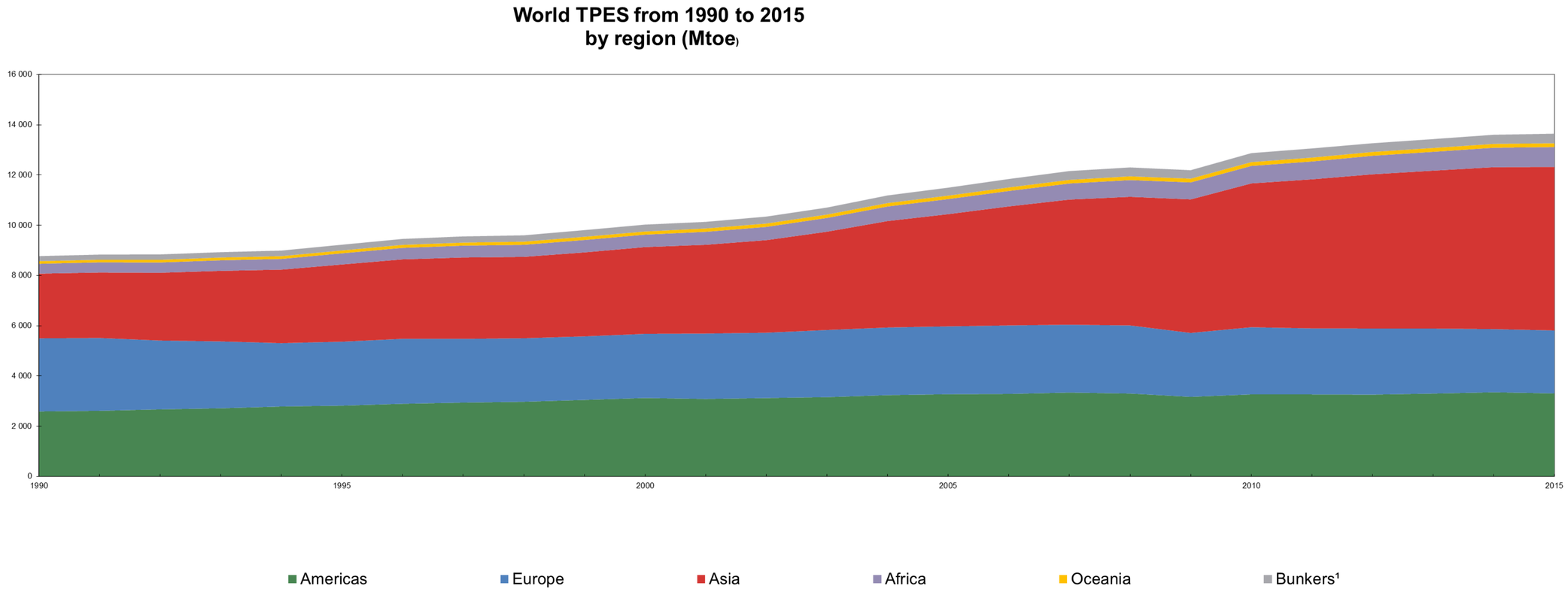
- Follow up survey now underway to highlight priority sectors from a statistical and policy need perspective.

Energy Data Transparency and Market Digitalisation

Overview

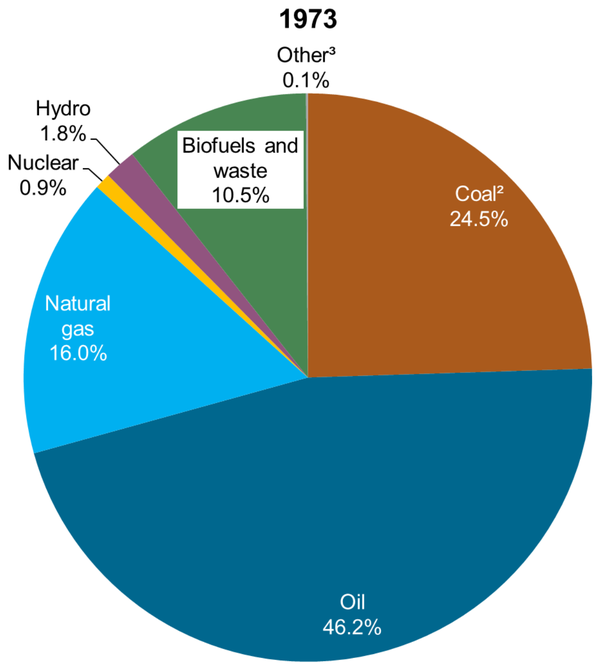
- The changes in energy
- Why data are needed
- Data governance
- International support and cooperation
- Challenges
- Opportunities: transparency and digitalization
- Conclusions

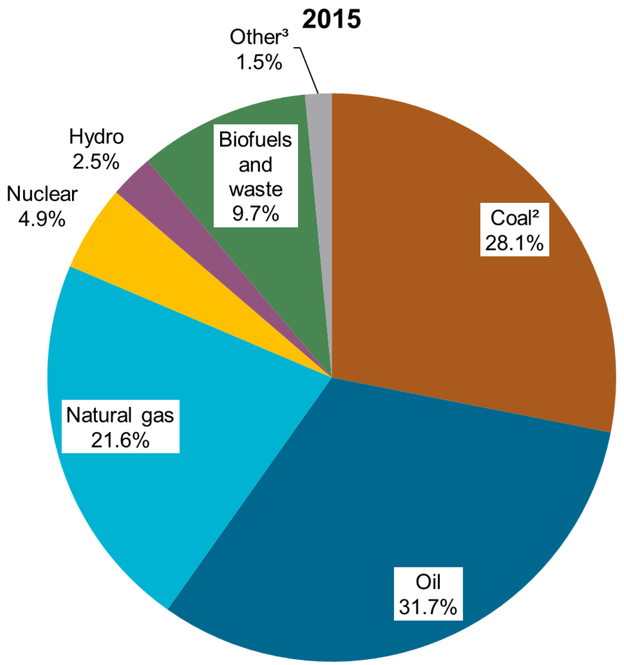
Global energy demand



Source: IEA, Key World Energy Statistics, 2017

World total primary energy supply by fuel





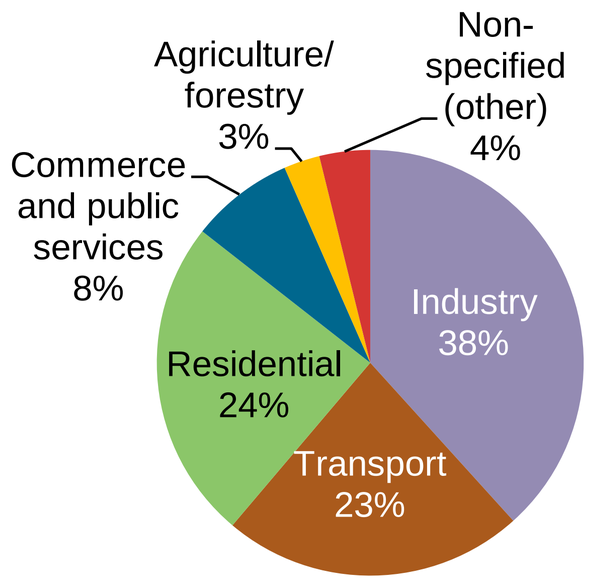
6,101 Mtoe

13 647Mtoe

Source: IEA, Key World Energy Statistics, 2017

World total final consumption by sector

1971



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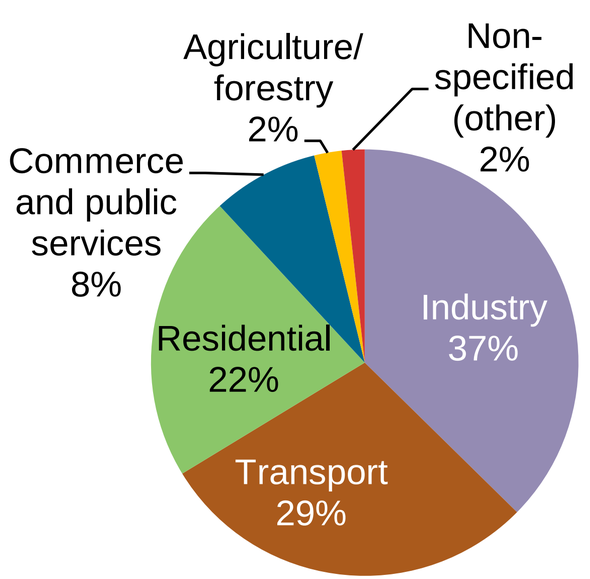
2015



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Source: IEA, World Energy Balances, 2017

The need for energy statistics

- Energy underpins all economic activity (output and transport)
- To ensure adequate security and understand risk to supply – be able to understand all flows and ability to model the future

- Energy systems are transforming
- Better data helps improve decision making
- Required to identify cost effective steps for each country's Clean Energy Transitions

- Provides clear understanding for investors and business
- Understanding energy use allows for efficiency, greater output at lower cost
- Design, monitor and evaluate policies

Data sources for policies

- Energy balances – the comprehensive picture of energy use in a country
  - Data on: production, trade, transformation (inc transformation efficiency), generation by type, headline energy consumption
- Energy end use data and energy efficiency indicators
- Prices
- RD&D – Investment
- Bespoke policy monitoring
- All need access to data and especially administrative data

Fundamental Principles of Official Statistics

- **Principle 1.** Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information.

- **Principle 2.** To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

- **Principle 3.** To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

- **Principle 4.** The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

Fundamental Principles of Official Statistics

- **Principle 5.** Data for statistical purposes may be drawn from all types of sources, be their statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

- **Principle 6.** Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

- **Principle 7.** The laws, regulations and measures under which the statistical systems operate are to be made public.

- **Principle 8.** Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

- **Principle 9.** The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

- **Principle 10.** Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

Sharing data within Government

- Government often seen as one entity (people/business not interested in departments)
- Some data (e.g.. tax, health, etc.) needs enhanced protection
- A lot of data at aggregate (and case) level can be shared
  - E.g.. if a transport departments knows number of cars on the road, sharing with energy helps develop efficiency indicators fuel used/car
- Efficiency – collect once use often
- Generates complete picture
- Reduces burden on business
- Can be a difference between sharing across Government and publication – publication at a higher level can be later
- Will often need MoU between departments

Key elements for statistical governance – in short

- Statistics inform the public, business and investors
- Made available on regular basis in an open way
- Impartial
- Trusted
- Methodologies chosen by statisticians and published
- Statisticians role to protect confidential data
- Legal basis
- Protection of confidential data
- Sufficiently resourced: more complex energy systems tend to need more staff
- Collect once – use often

Good data governance leads to – Good (energy) data

Key elements

- Relevant
- Reliable
- Timely
- Consistent
- Cost efficient
- Comparable over time
- Comparable between countries, provinces, cities… according to needs

Addressing the challenges to energy data

- G20 countries typically lead the world in having the most comprehensive energy data

- But challenges exist, including
  - Cooperation from business in supplying timely data
  - Confidentiality concerns that prevents data being provided
  - Gaps in the data e.g.: stocks (levels and change), trade breakdowns, non-energy use
  - Incomplete coverage (e.g. of all forms or power generation)
  - Liberalization of energy markets – one company to many
  - Accuracy – e.g. the need for good CV data

- The problems can be solved and many are taking action – need to share practice and work with international guidance and international organisations

The new challenges to energy data

- Increasing desire for detailed data on energy end use to make informed policy choices
  - Energy use data creates understanding of the service needed – the why energy is used, not just the what
  - Need detailed energy data and related activity data
  - G20 Energy End Use initiative co-led by France and the IEA
  - Learning from each other, sharing tools and new ideas, developing new approaches

- Off grid generation
  - bring energy to millions of homes, but real issues for measurement
  - Irena leading work to utilize customs and other data to make informed estimates of generation based on mass on PV cells imported
  - Wider outreach also highlighted many other forms of small scale local renewables not covered in official data

- Increasing development of producers being consumer for electricity – how to measure self use

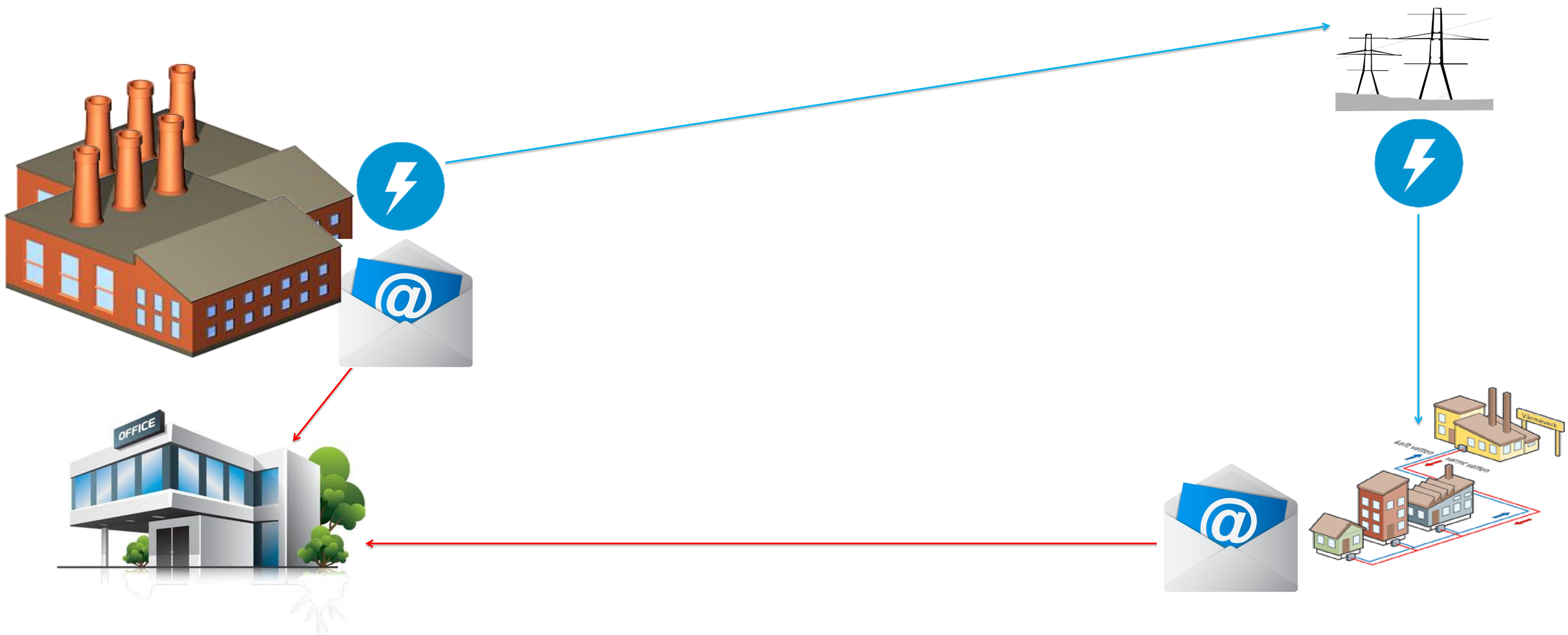
Maximizing new opportunities

- Transparency
  - Transparency of data builds confidence
  - Increases engagement and informs debate
  - Data informs all markets: data vacuums cause uncertainty and increase volatility
  - JODI

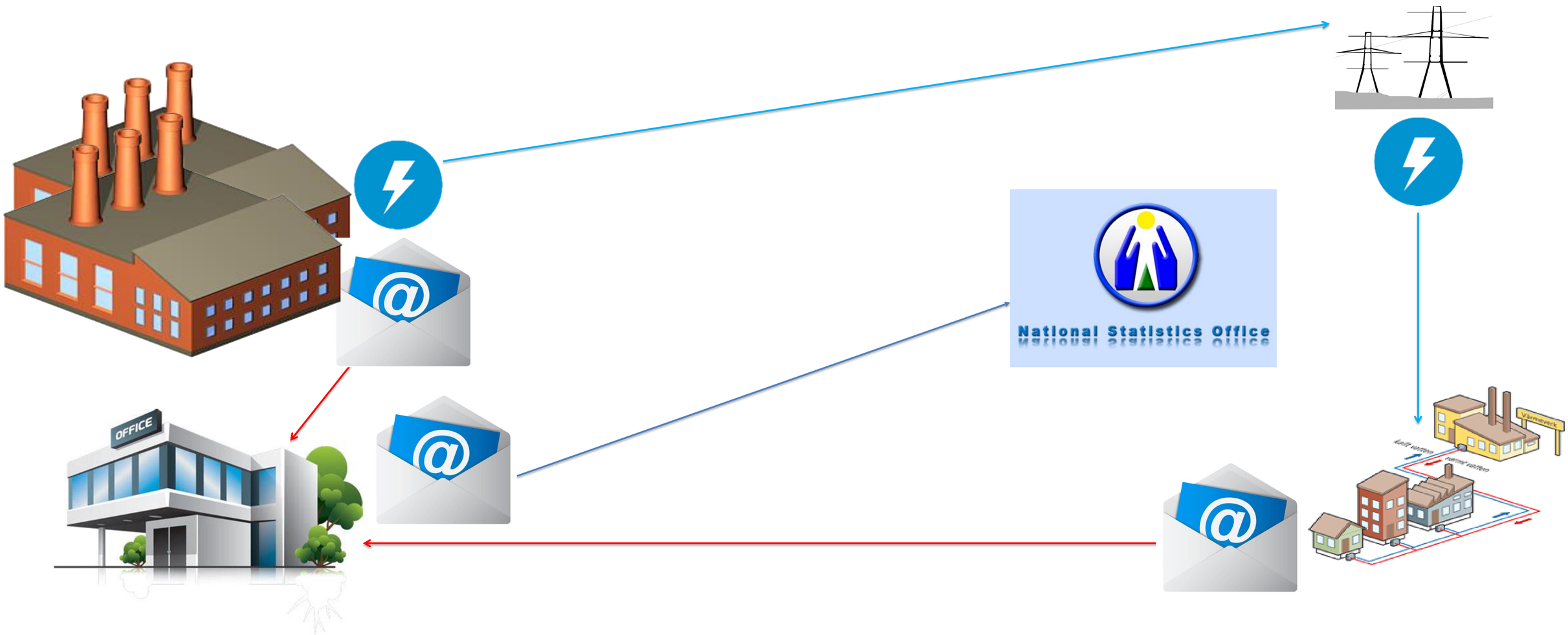
- Open data
  - Increasing drive to open data and make available to all – provides business opportunities and supports academic work
  - Computer power and development in treating confidentiality are making it easier to release larger data sets

- Digitalization
  - A potential game changer for energy data:
  - Already increasing use of GIS
  - Data matching (e.g. UK's NEED matching data to understand energy efficiency)
  - Significant potential with the appropriate regulatory/legal framework

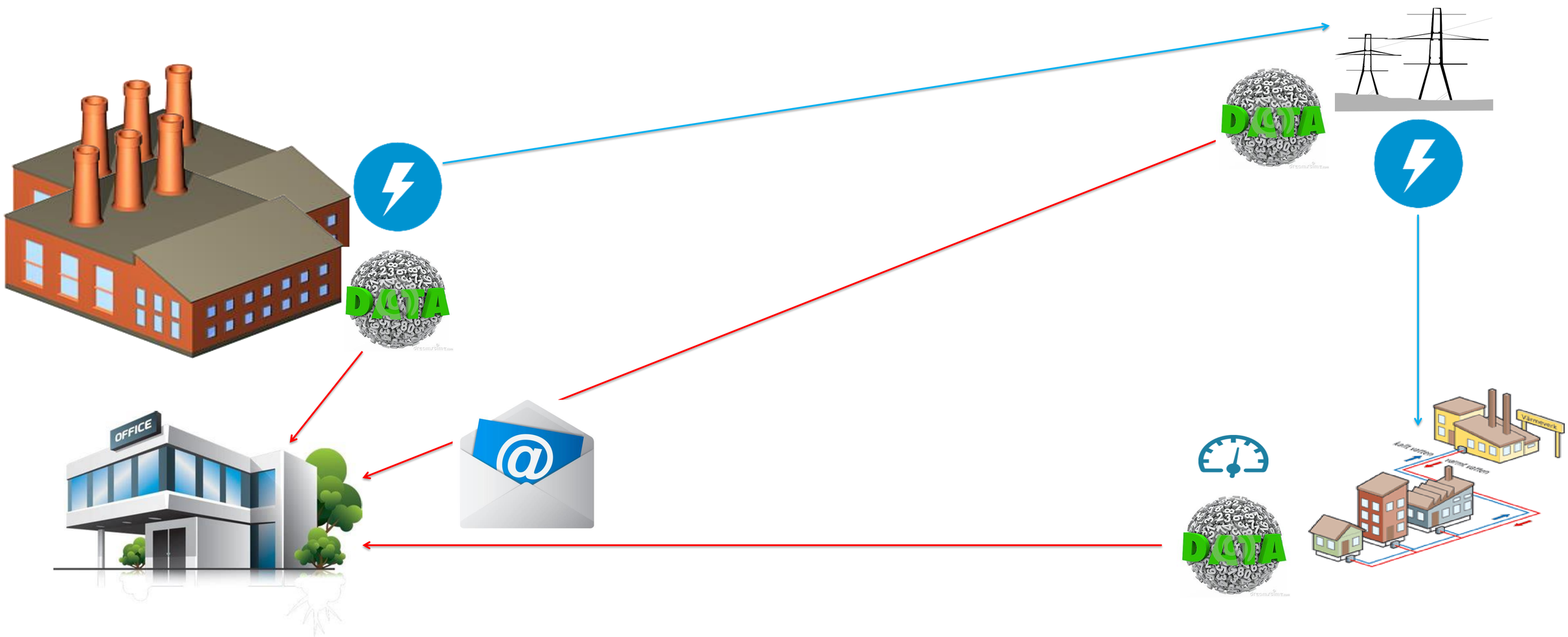
Electricity: power flows in a non-digitalized system



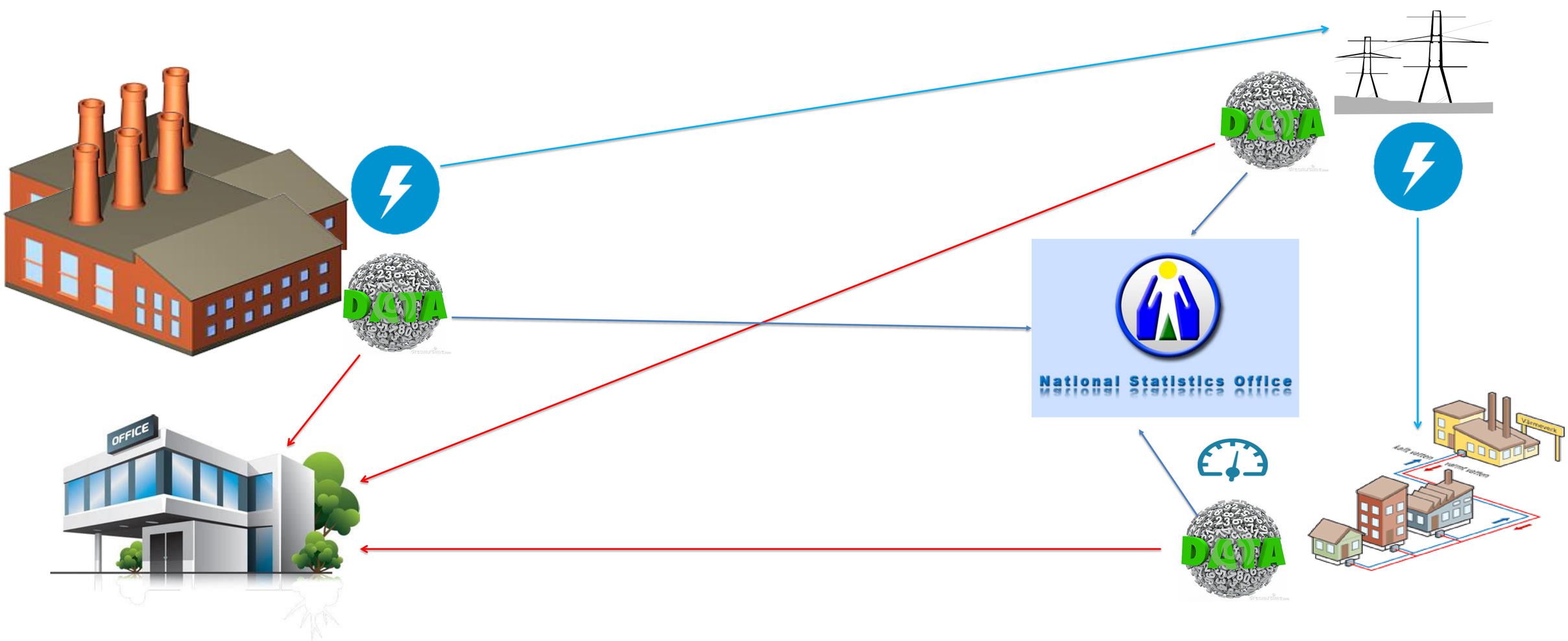
Electricity statistics in a non-digitalized system



Electricity: power flows in a digitalized system



Electricity statistics: in a digitalized system?



Digitalization – one example to improve data?

- 1st phase?
  - Business have more timely data (e.g. digital twin of power stations, direct monitoring of networks)
  - Official data still dependent on collection from business (monthly) and consumers (annual with large lags)

- 2nd phase?
  - Automatic flows of data from digital systems in homes and businesses to statistical offices?

- Could it happen?
  - Official stats do not need time critical data, aggregation over time periods (e.g. 1 hour) or time lags (weeks) still a real benefit
  - Detail data could have a longer lag of months
  - Need legislation to maximize the benefit of using data whilst ensuring data protection

Support from international organisations

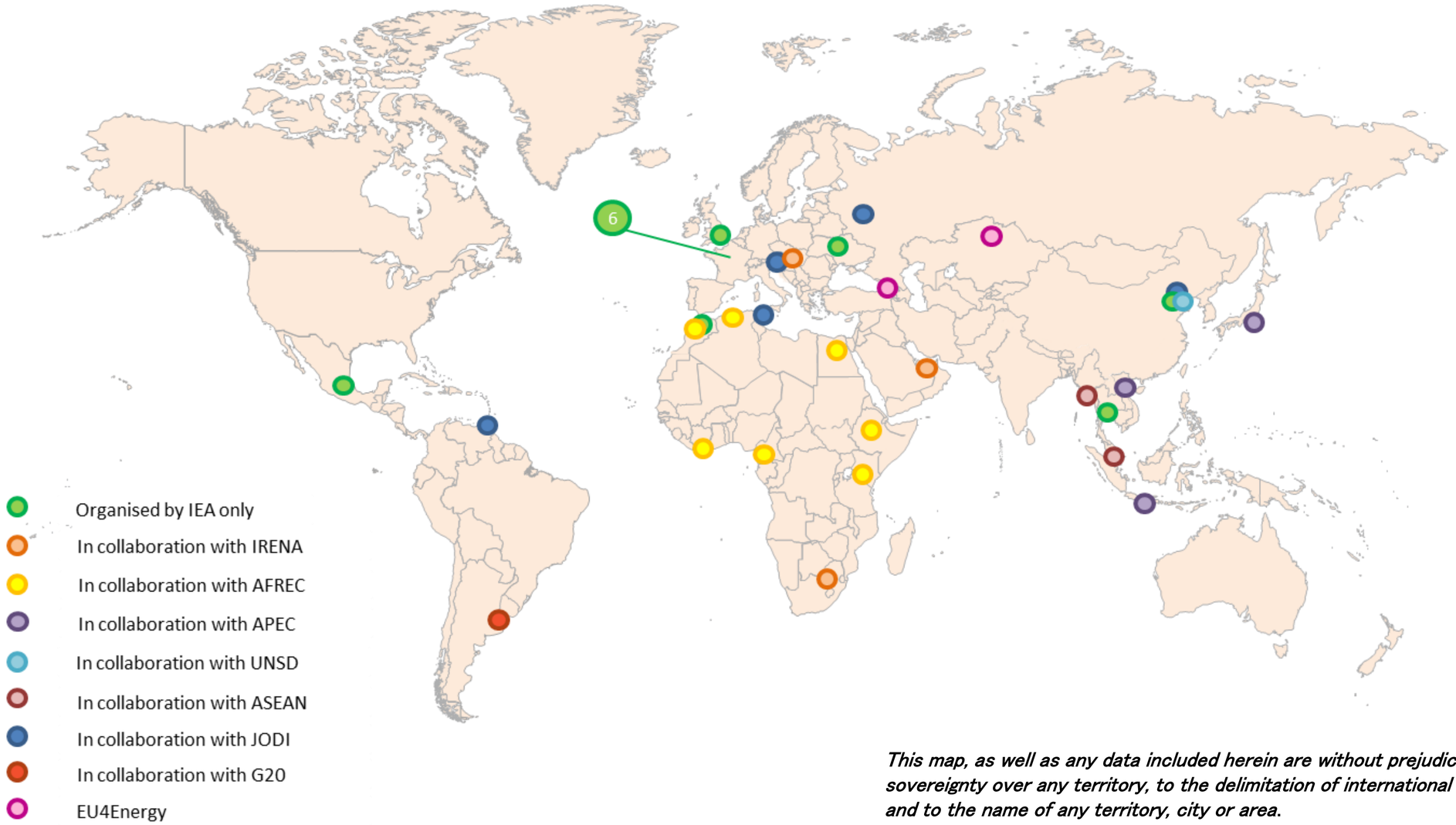
- International Recommendations for Energy Statistics
  - Developed by over 20 organisations and agreed by the UNSC as a guide to producing comprehensive and comparable energy statistics
  - Full product classification with definitions
  - Energy balance as the framework to understand energy
  - http://unstats.un.org/unsd/energy/ires/IRES_Whitecover.pdf

- Regional cooperation between Agencies, especially in Latin America

- Common data collection
  - Increasing efforts to harmonize data collection under common terms, long experience with IEA, EU, APEC – very positive work now underway with OLADE and IEA

- Training and capacity building
  - Manuals in multiple languages
  - On-line – the IEA web videos (being translated)
  - Coordination of training

Collaboration with other organisations



This map, as well as any data included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Conclusions

- Enhancing the comprehensiveness of energy data will lead to better decisions.

- G20 members can further support this by:
  - being open with their data and their methodology;
  - work with the IEA and others to build up tools that all countries can use; and
  - support the efforts of all international organisations in capacity building.

- Resources and their allocation are essential to establish and maintain a national energy statistics system:
  - how energy data are prioritised vs other statistical areas;
  - how synergies can be exploited between energy and other policy areas;
  - what priority is given to the monitoring component within the policy formulation process; and
  - how resources are allocated across areas within the energy domain.

- Data governance and proactive regulation are needed to address any current weaknesses in data collection systems and to ensure that the maximum benefit can be achieved from digitalisation whilst maintaining confidentiality

- Data need to be comparable, timely, regular, complete and made available in a transparent way

Possible discussion points

- Are data gaps or lower quality data creating barriers to effective policy making?
- How can policy makers support statisticians to achieve the data that is needed?
- How can G20 countries work together and with organisations such as the IEA to improve energy data?
- How can the benefits of digital data be realized to improve official energy data?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ARGENTINA 2018