22 January 2019
GRESB Data Quality - Technical Working Group - Minutes Second Meeting

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Attendees for in-person meeting on 7 March

Attendees

Note taker: Anna Roberto, GRESB
Speakers: Ragnar Martens, GRESB
Emma Storm, GRESB

Attendees:

<p>| BRE | Daniel Skidmore |</p>
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**Absent Working Group Members**

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<td>Dennis Krieger</td>
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Agenda

1. Introduction to the GRESB ESG Data Quality Standard (5 min)
   - General overview of the TWG and overview of agenda
   - Welcome Emma Storm to GRESB
   - Why do we need a Data Quality Standard?
     - Scale
     - Leadership - recognize leaders in the market
     - Increased transparency - trust the data that is being submitted
     - Provide better feedback to the market - drive better ESG adoption and change
     - We need high quality data to accomplish these items
   - GRESB Style Assessment - structured around 4 aspects of data quality that are universal - these are recognized data quality standards and systems
     - Accuracy, completeness, timeliness, lineage
   - Build base in 2019 to provide precise metrics as industry knowledge deepens

2. Introduction of participants of the TWG (15 min)
   - ~30 participants in TWG
   - 13 on this call
3. Discussion on first draft of the data quality assessment (30 min)

Walk-through of changes to the assessment

- **Accuracy**
  - Moved non utility data to separate indicators
  - Included non-utility data which is relevant for utility data
  - GHG Emissions - will discuss how to measure later in the call
    - This was moved to a separate indicator

- **Completeness**
  - Clarifications based on TWG groups comments
  - Indicators 5&6: modified wording of questions and options based on feedback
  - Indicator 7: estimating missing data - leaving the same for now but will come back to this indicator later on
  - Indicator 8: completeness of non-utility data - restructured based on feedback

- **Timeliness**
  - Indicator left the same for now, will discuss in detail later in the call

- **Lineage**
  - 10 + 11 are the same, will discuss metadata later in the call
  - We have added an indicator on auditing

Open Discussion

**Estimations**

- Estimations and how this is relevant to the assessment
- Estimations of utility data vs non-utility data
  - Relevant to both accuracy and completeness

- **Accuracy**
  - How much of your data is estimated? → Good way of measuring accuracy. 
    *Would like to hear feedback from group in this regard*

- **Completeness**
  - Missing data that is estimated is more complete than purely missing data

- **GHG Emissions**
  - Estimated from energy data
  - Including indicator on this aspect - open to feedback in this regard
  - How are GHG emissions calculated?

**Comments**

- Chung Cha
  - Why does utility data need to be estimated?
  - What is the relevant data that we want to get?
In terms of E (environment) how much energy, gas and water are they using… Why does this need to be estimated? If they can provide how much kilowatt they are using, kilowatt hours per sq meter per annum - this number could be a good determinant of how efficient or not efficient these buildings are.

- Ragnar
  - We want to paint a full picture, and not purely focus on energy and water intensity. Missing meter readings and missing utility bills could provide value.

- David Solsky
  - We deal with many customers that are challenged by completeness and accuracy of data with missing data points etc.
  - When customers make estimates along GRESB approved methodology, they should be rewarded for these extra efforts opposed to those who do not paint a complete picture of their performance.

- James Lee
  - Some data can only be estimated
  - Find two types of estimations
  - Data from meters - when these need to be allocated to different categories/indicators while reporting - we need to make an estimate of energy allocation - this provides year to year comparisons
  - Solar hot water system - est. how much energy use avoided or saved - this formula is not simple, dependent on temperatures, water flow volume etc. which changes on a daily, weekly basis…
  - This data needs to be granular in order to be accurate

- Ragnar
  - Solar hot water system data - this seems similar to GHG Data
  - Following a standard and knowing this standard was followed can provide value for these estimations

- Christopher Hill
  - Would there be a distinction between where utility data is estimated by the utility provider as part of the bill, as opposed to where utility data is estimated by the client because there is missing / suspect data.
  - Utility providers attempt accuracy
  - Data providers to GRESB providing own estimate on data received (ie. to cover missing data)
  - 2 ways of estimations (utility companies vs GRESB participants) used to fill gaps

- Daniel Skidmore
  - I agree with James Lee, the scope of assessment methods can cause challenges to some assets based on their metering strategy. We have been looking at this in BREEAM to develop a consistent Energy Allocation Tool.
  - Similar reporting issues in other assessment methods
  - Scope may not always meet the metering strategies
Many of us have developed a methodology internally that takes in exact meter data and allocates to what is being assessed. Can be helpful to the standard.

- Ragnar
  - We want to take apart estimations and ensure that we govern these processes coherently and ensure they are unified across all GRESB submissions.
  - Can use 3rd party assurance to ensure that these standards are being applied, and to have more confidence in how these estimates are calculated.

**Timeliness - as a pillar**

- Time difference between when a measurement is made and when it is recorded in the data system.
- Other data quality assessments follow that the shorter this time is, the more confident you can be that data is accurate and complete (empirical discovery).

**Reasons to keep**

- High levels of accuracy and completeness easier to achieve if time between recording and measuring is shorter - we want to capture this metric with this indicator.
- Other indicators within assessment that capture issue.
- Indicator could be wrapped up within others.
- We think keeping it is important.

**Reasons to remove**

- Indicators on estimation.
- Flagging anomalies.

**Comments**

- Ragnar: can be a proxy for a high quality reading system.

- David Solsky
  - From a pure data quality perspective - there is a strong argument to be made to keep this metric. These 4 principles are extremely important to keep within the data quality standard as these are agreed upon standards. End of year review - utility data recorded on a year basis doesn’t have as much accuracy and data measured on a regular basis. More frequent access to data and timeliness will bring more granularity to data.
  - Want good data quality but also want improved performance.
  - Timeliness should be part of the Assessment.
  - Granularity - this needs to make its way to standards in general - beyond just data quality in order to improve performance of assets.

- James Lee
  - agrees with David - The PERIODICITY of reporting can also be an important aspect of timeliness. e.g. monthly reporting can avoid potential errors in data aggregation in quarterly reporting.
More frequently you can record the variation of data, you can analyze anomalies at a greater level.

Granularity addresses recording.

Timeliness addresses reporting.

Formerly was reporting on quarterly basis - by aggregating 3 months into a quarterly report - this adds a layer to possibility or error - switched to monthly recording so data aggregation is not needed → reduces potential layer of aggregational error.

Periodicity of reporting is an aspect of timeliness.

- Ragnar
  - addressing 2 issues with the timeliness indicator
  - How long does it take to record
  - What are the frequency of these recordings
  - Would like to have feedback on indicator 9

- Tom Saunders
  - I agree with David and James. Frequency (and granularity) of data more important than the time difference between collection and adding it to the system.
  - Granularity is important in terms of separating data, as well as in relation to time.

- Jakub Bartnicki
  - I agree with all comments before with a caveat that we would need to apply different scoring or "importance" to timeliness and periodicity depending on data type (e.g. energy vs water)
  - Need to be careful about how we approach different data types
  - Look at other data streams that are as important for ESG but not as easily or feasible to measure.

- Ragnar
  - Look at how we can incorporate this into the timeliness indicator.

- Chungha Cha
  - I agree with David in that "performance of assets" should be one of key drivers for collecting the data ... I have seen systems updating data on 15 min intervals.
  - Takes much effort to report data - and this is linked to performance of assets.
  - If we get good data on a daily basis, asset operators can understand whether they are on track or not.
  - Can make changes in operation or behavior based on this performance to reach or improve on targets.

- Ragnar
  - This is when data quality becomes a driver of improving ESG performance.

- Daniel Skidmore
  - I agree that granularity is important, I think we just need to be careful to define what we mean by this. Granularity can be provided by improved reporting over time (i.e. more frequently), space (i.e. over smaller, more accurate areas) or metrics (i.e. over more metrics).
  - We can make data more granular over many areas - we need to define the scope.
○ Asset vs metric level
○ Need to be careful with using term granularity - needs to be well defined and broken down

Relationship between metadata and data quality

- What do we mean when we say metadata?
- Existence of robust metadata system implies good data management and can aid traceability
- What kinds of metadata are relevant in this context of the assessment?
  - Timestamps? Locations? Other tags?
- Serves the timeliness aspect - can't measure timeliness unless you collect this type of data
- Ultimately doesn't say anything about accuracy or validity, but is a proxy that serves these points

Comments

- David Solsky
  - Need to ensure that metadata tags are kept simple eg for a meter it's a utility meter, smart sub meter, manually read meter etc. the low level metadata may be less relevant
  - Risk at a high level is that much work is created because respondents need to find this data
  - Depending on the nature of the meter (automatic, manually read) - this has a big impact on the ability to provide data
  - Low level data may not provide much value
  - A standard tagging system may provide much value

- Ragnar
  - Don’t want to add more reporting burden
  - Want to attach higher quality metrics to this kind of meter

- Jakub Bartnicki
  - Metadata as an aspect is interesting and important but we need to ensure the definition is more broad that software stream data (i.e. from quality perspective manually read meters should not be penalised as long as relevant tags are recorded)
  - Would never look at single data stream as valid
  - If we put too much value on metadata tags (i.e. time stamp) we may be unfairly penalizing other data sources

- Ragnar
  - this is a proxy that serves good data quality (may become irrelevant over time)

- Salil Narayanan
  - location data will be important for weather normalization & benchmarking

- Ragnar
○ Discussion on normalization is not being tackled in this assessment - focusing on the raw data
○ How is it transformed and related to the GRESB RE standard

● James Lee
○ Would a system diagram, or a visual audit trail, help to address the issue of metadata as well as data audit?
○ Create overall blueprint of how data is mapped from meter all the way down to reporting sphere
○ All metadata could go on to this blueprint (whether smart or manual meter)
○ Auditors could refer to this - creates an easier way to understand data source and direction

● Ragnar
○ Would this increase the reporting burden on participants? Is this something that could be provided? We invite you to further this discussion in the Google document that we have provided - suggest edits/comments

4. Implementation for 2019 (10 min)

● Conclude development of Data Quality Assessment for 2019 at in-person meeting in March
● Assessment will be implemented this year
  ○ Goal is to release the assessment on 1 April, probably outside of the portal
● GRESB Data partners and participants operating internal asset software platforms are invited to take this assessment
● Prerequisite - there needs to be an API connection with the GRESB asset portal
  ○ There is no human step in providing this data - no errors
  ○ More information at https://gresb.github.io/api-docs/
● How will results be published?
  ○ Will publish an aggregated results report to inform development
  ○ Won’t be shared with any investors or any parties outside the group of participants
  ○ Individual results will be shared with the participants only
● How do we recognize these results?
  ○ All those who participated should be recognized as this is an extra layer of effort
  ○ Can determine whether they want to be publicly recognized or not
  ○ Asset data submitted under the data quality standard to be recognized in GRESB reports
● Will discuss these points further in the in-person meeting
5. Summary and next steps (10 min)

- Provide notes and comments on working materials until 31 January
- The earlier you comment, the earlier feedback can be provided (we will conclude the discussion on the 31 January)
- 7 March - in person meeting will be held in NY (Alexandra Real Estate Equities as host)
- Please inform Ragnar or Emma if you will be attending before 31 January by email
- List of currently registered attendees published below
- 1 April - date of release for assessment
- Check-in meeting in May to look at feedback on current submission
- Results of Data Quality Assessment released during same time frame as GRESB results
- In-person meeting preliminary agenda
  - Finalize the Data Quality Assessment
  - Implementation in 2019
  - Discussion of version 2 of the Assessment
  - What are the technical tools to implement this standard properly
  - Is the GRESB Portal API enough to implement this
  - Minutes will be shared, and meeting will be partially recorded

- **Comment**: Chungha Cha - I am so disappointed that I will not be able to join the "in-person" meeting on 7-Mar in New York. I am speaking at the PERE Proptech conference during 6-8 March in Hong Kong ... and, then, will be at MIPIM Cannes 12-15 March. Would love to meetup in HK or Cannes if anyone in this group is attending. Cha I am on WhatsApp linked to my mobile +82.10.9560.0888.

### Attendees for in-person meeting on 7 March

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