UNECE

ENERGY

# Evaluation of $CH_4$ Survey

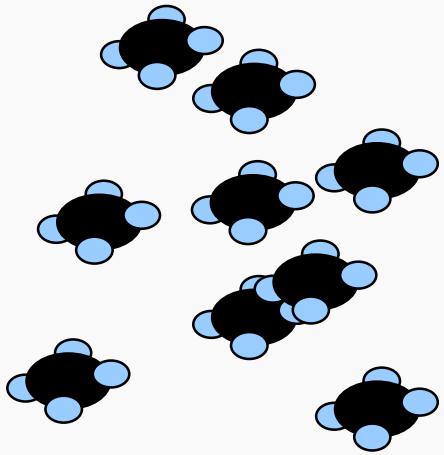
## Emissions Monitoring 2016/17

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- Back Ground
  - Survey on **$CH_4$ (methane) management in extractive industries** was distributed in December 2016 and assembled early in 2017
    - By UNECE in Geneva
    - via web sites of
      - Committee on Sustainable Energy
      - Group of Expert on Gas
      - Group of Experts on Coal Mine Methane
      - Methane Management page

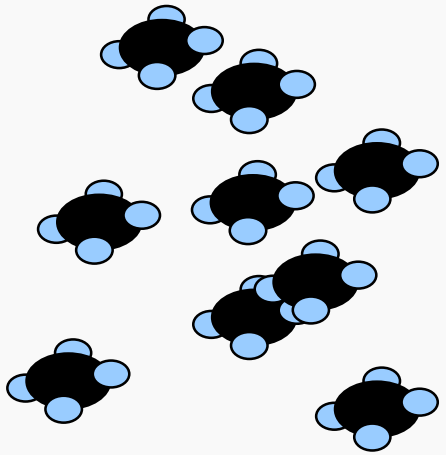


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- Back Ground
  - Survey on **$CH_4$ (methane) management in extractive industries** was distributed in December 2016 and assembled early in 2017
    - By UNECE in Geneva
    - via web sites of
      - Committee on Sustainable Energy
      - Group of Expert on Gas
      - Group of Experts on Coal Mine Methane
      - Methane Management page
    - also via partners such as
      - International Gas Union
      - World Coal Association
      - World Petroleum Council

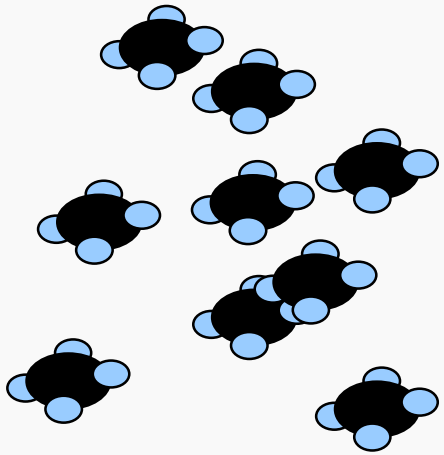


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- Back Ground
  - Survey on **$CH_4$ (methane) management in extractive industries** was distributed in December 2016 and assembled early in 2017
    - By UNECE in Geneva
    - via web sites of
      - Committee on Sustainable Energy
      - Group of Expert on Gas
      - Group of Experts on Coal Mine Methane
      - Methane Management page
    - also via partners such as
      - International Gas Union
      - World Coal Association
      - World Petroleum Council
    - .. encouraging to share survey to others
    - Therefore, no knowledge of how many have received the survey inquiry



# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- Back Ground *continued*..
  - 95 responses
    - from around the World
    - 16 were disregarded due to being:
      - too incomplete (13 pcs with very few boxes ticked)
      - wrong type of respondent (3 pcs not from extractive industries)
    - 79 are included in this analysis

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- Back Ground *continued*..
  - 95 responses
    - from around the World
    - 16 were disregarded due to being:
      - too incomplete (13 pcs with very few boxes ticked)
      - wrong type of respondent (3 pcs not from extractive industries)
    - 79 are included in this analysis
      - Responses from Midstream and downstream oil merged
      - " " " " " gas merged
      - Upstream oil/gas kept as is
      - Coal kept as is

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

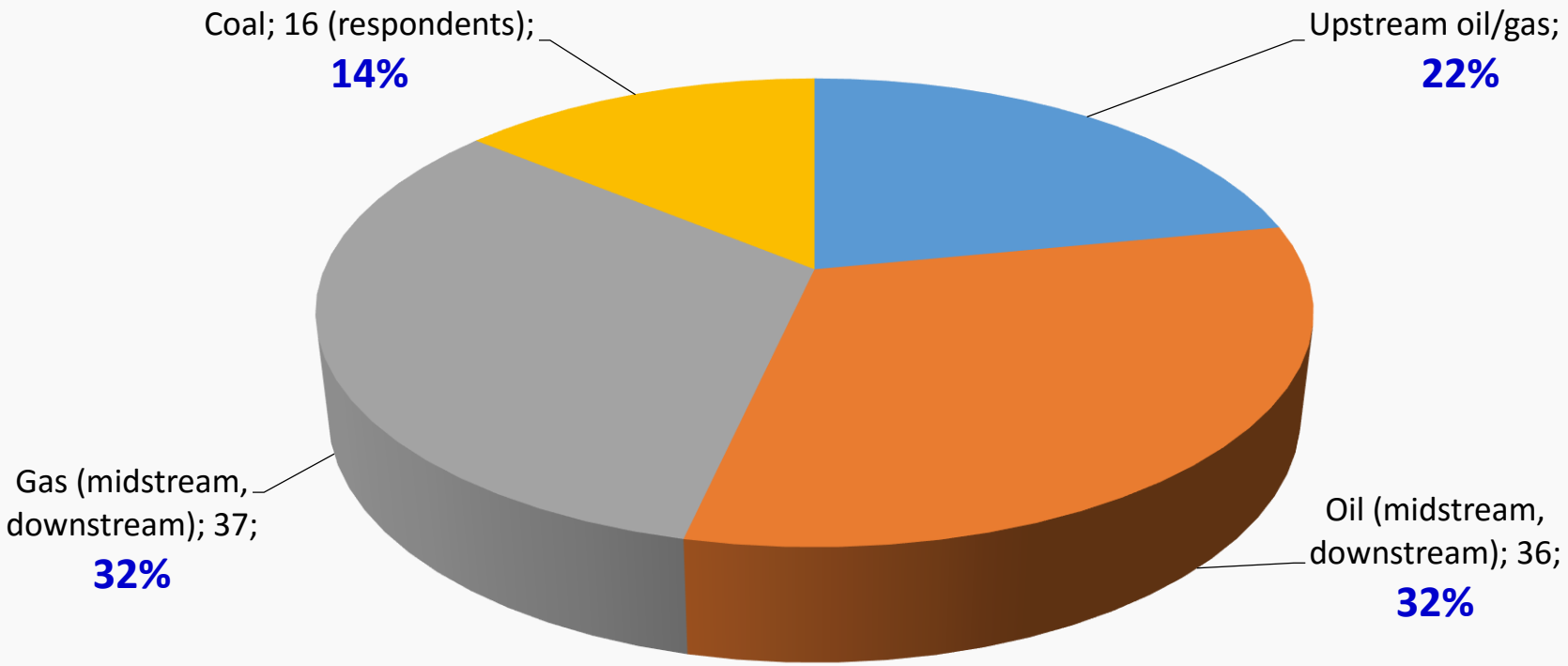
- 28 questions;

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 1 Type of extractive industry? Many respondents noted several categories

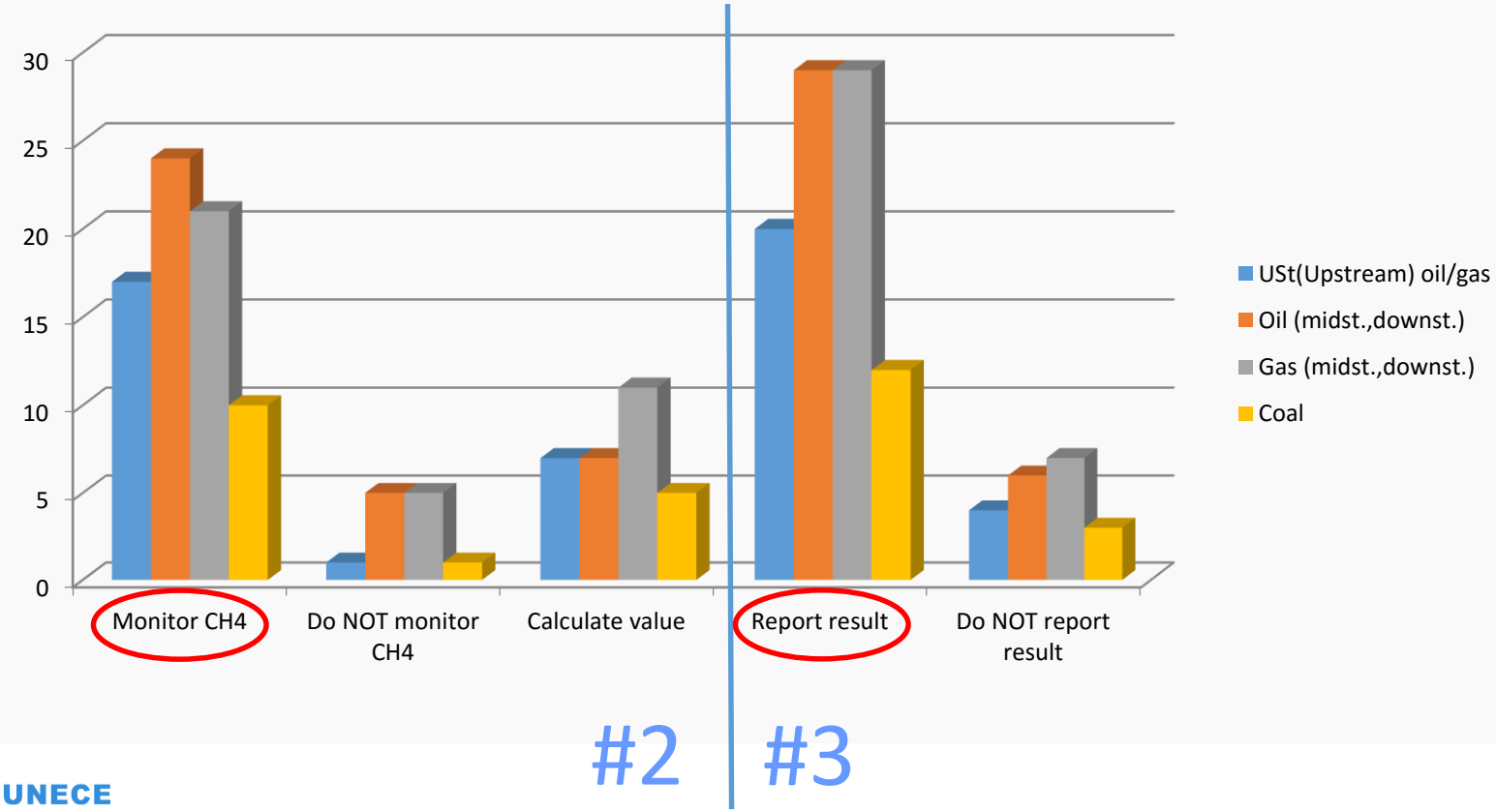


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 2 Do you monitor/calculate $CH_4$ or other CH emissions?
- # 3 Do you report the results?

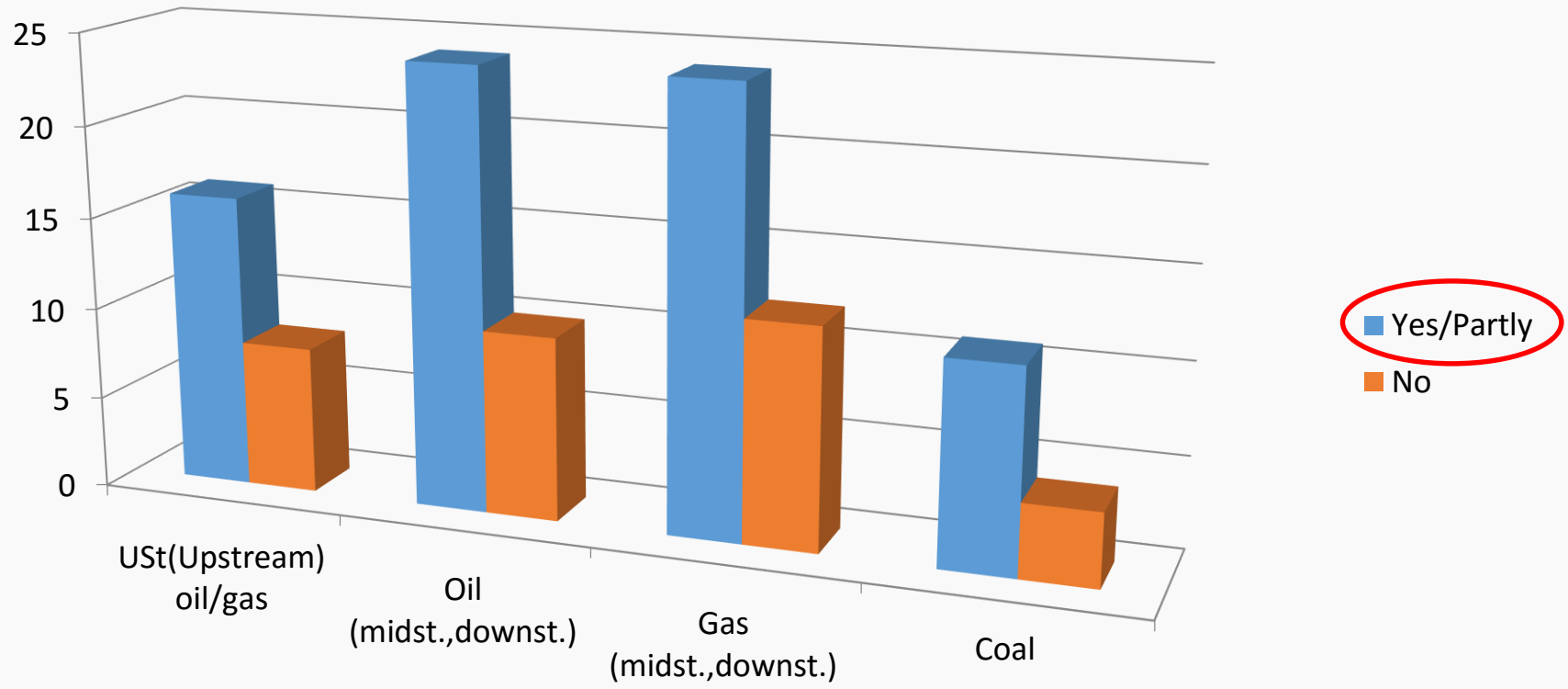


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 4 Monitoring of $CH_4$/CH emissions mandated by law?

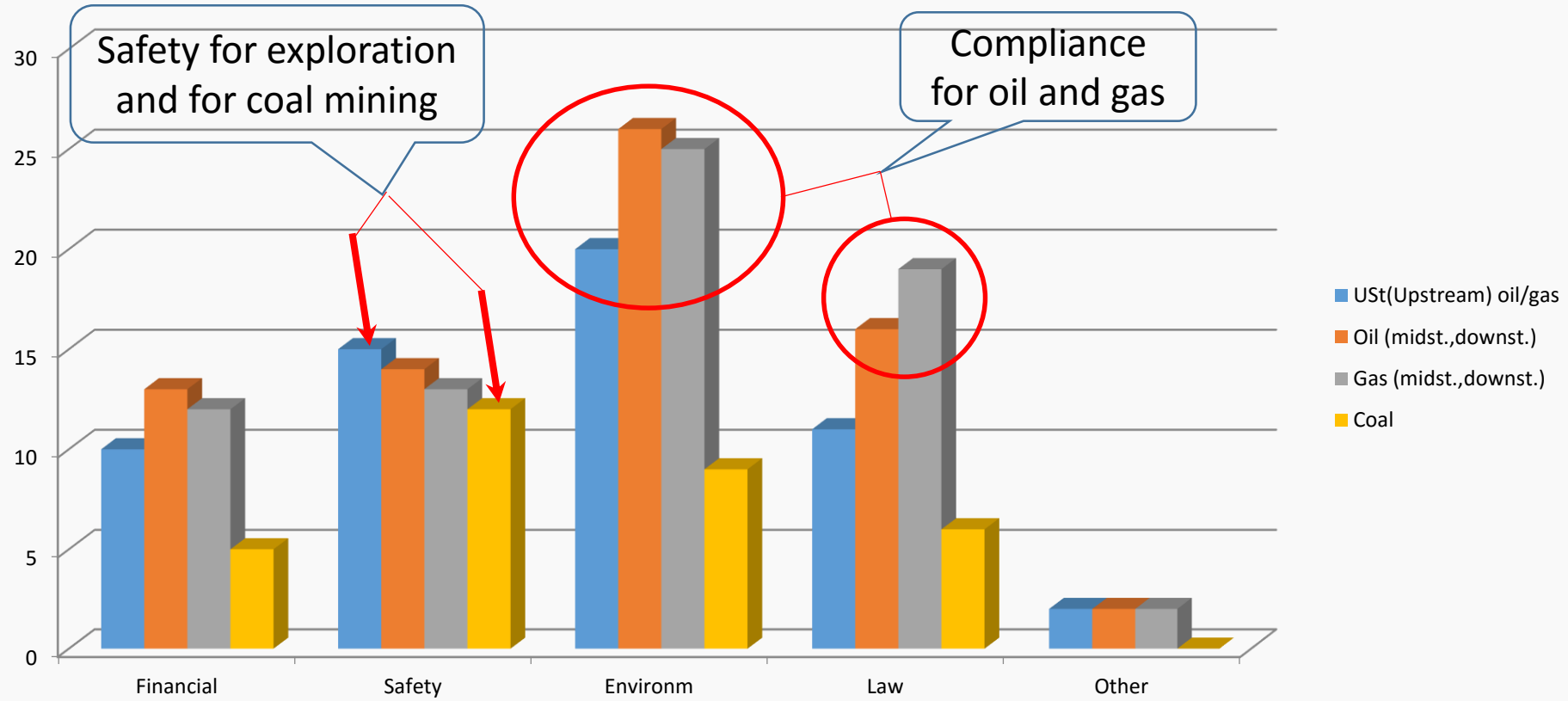


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 5 Primary purpose of monitoring $CH_4$/CH emissions?

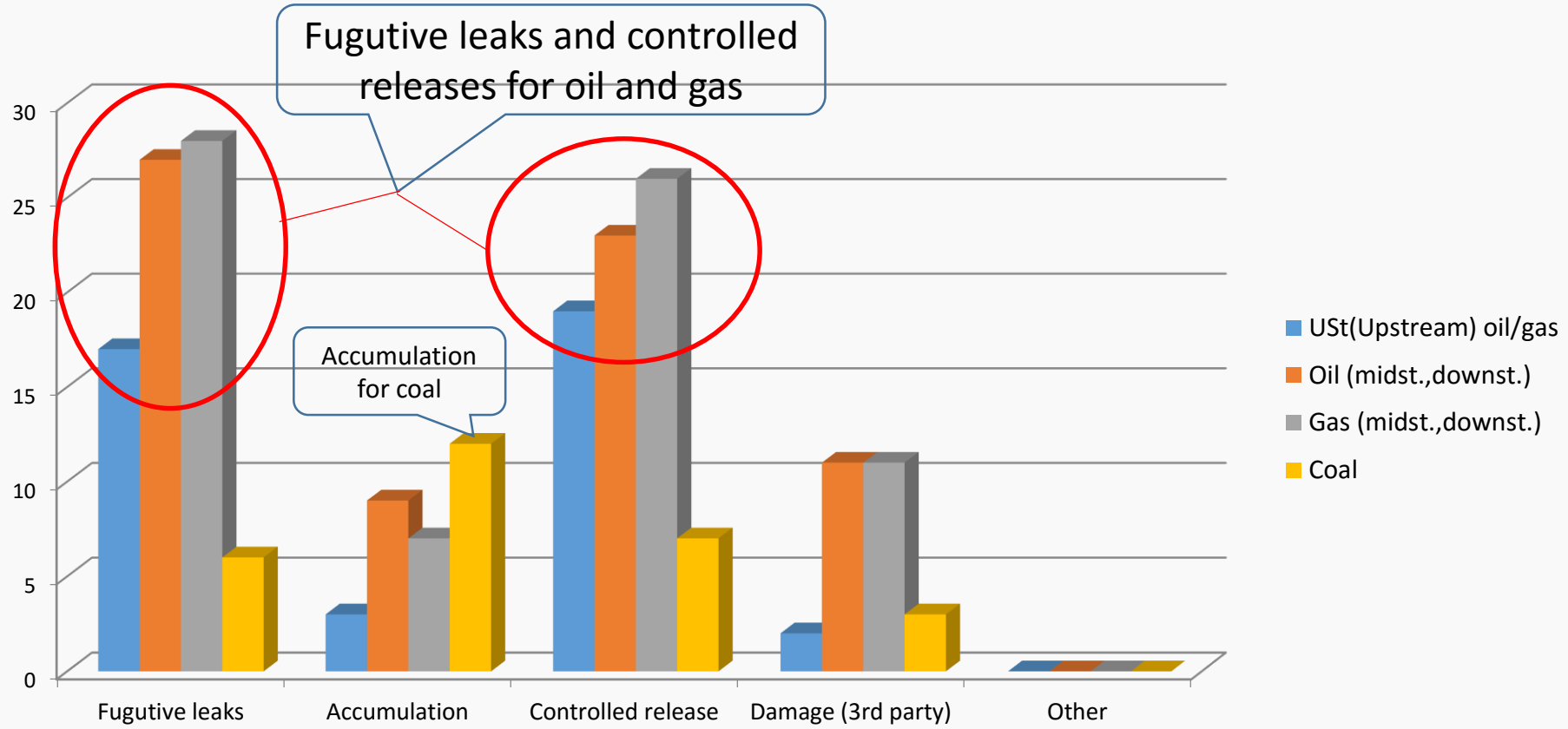


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 6 Nature of $CH_4$/CH emissions?



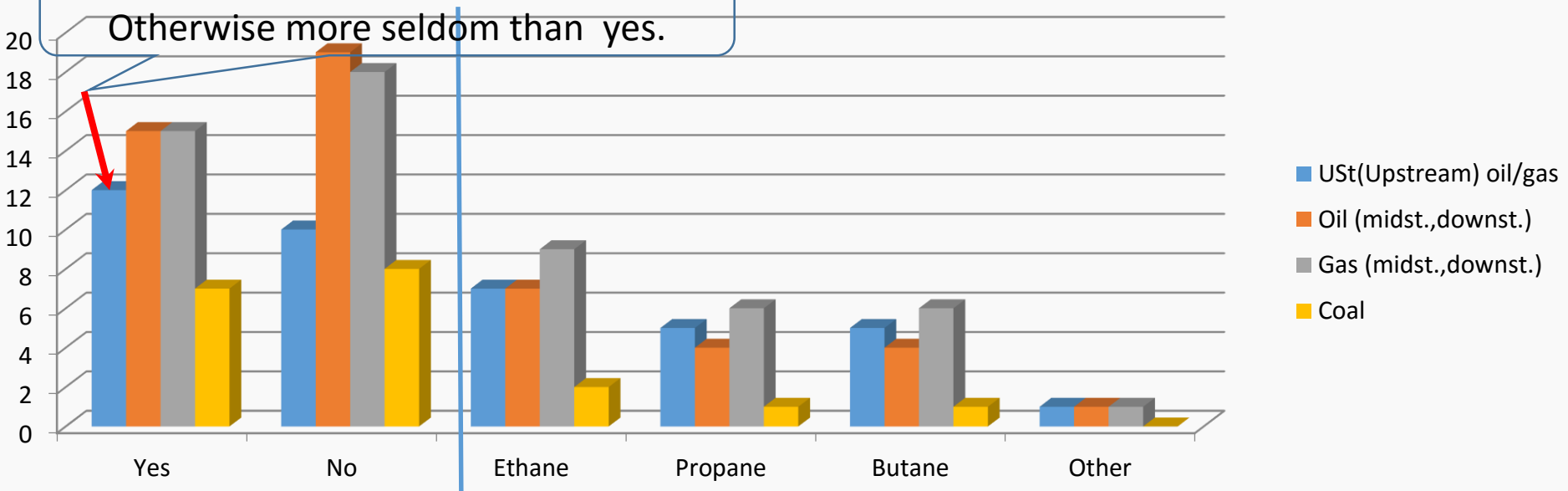
# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 7 Do you distinguish between $CH_4$ and other CH?
- # 8 What other CH than $CH_4$?

Slightly more often in exploration.
Otherwise more seldom than yes.




#7

#8

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

*# 9-12 are too wide spread to present in graphic form.*
*- also obvious in nature ..*

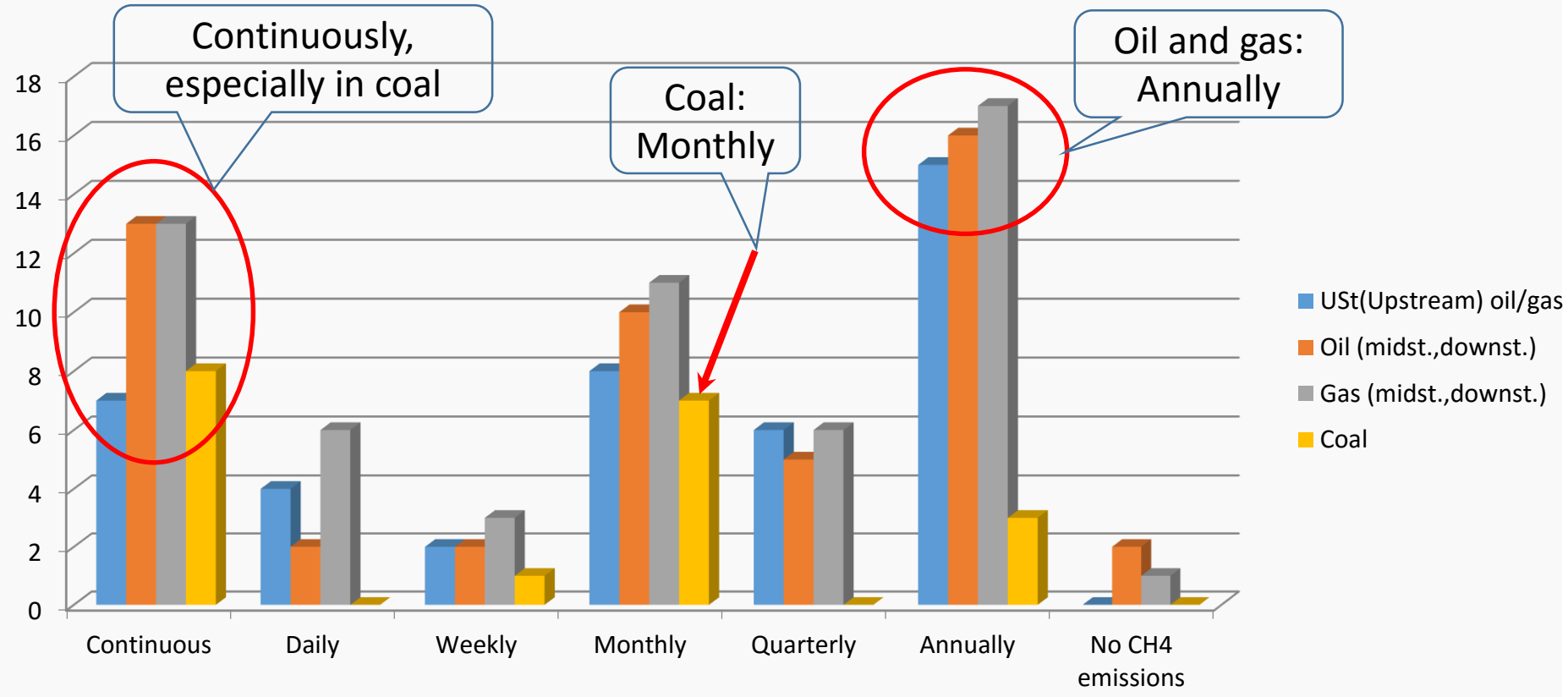
- # 9 What components of your facilities do you monitor?
  - "All", "Most", "Where potential leaks", "All emitting equipment" ..
- # 10 Why those particular components?
  - *"Potential emitters", "Legislation", "Worker safety" ..*
- # 11 What processes do you monitor?
  - *"All", "Most", "Hazardous work area" ..*
- # 12 Why those particular processes?
  - *"Potential emissions", "Regulation", "Health and safety" ..*

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 13 With what frequency do you monitor?



# Evaluation of $CH_4$ Survey

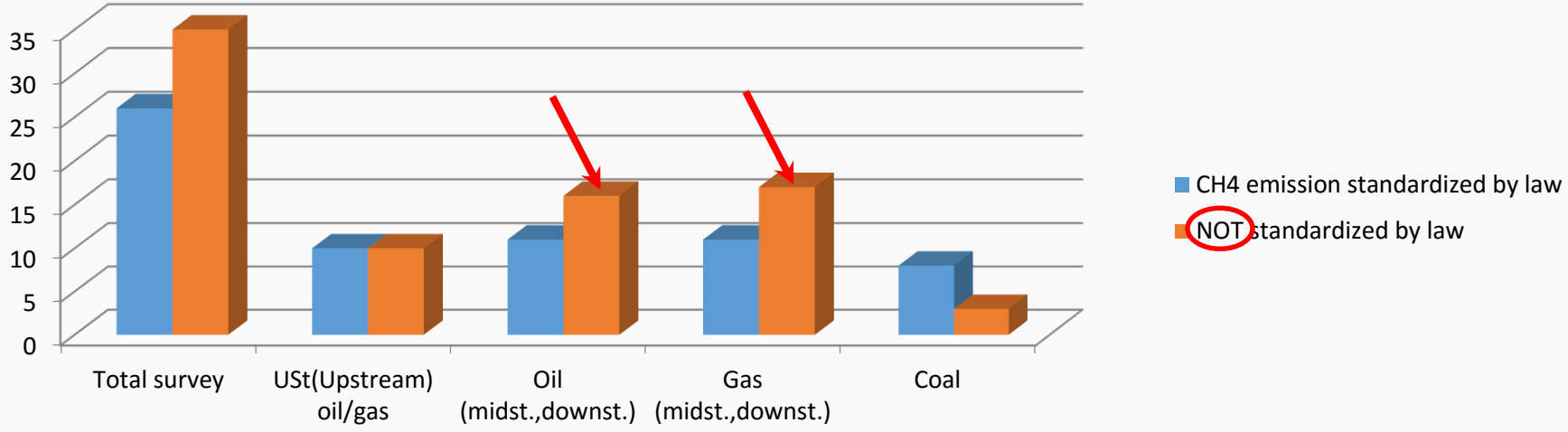
## Emissions Monitoring 2017

ENERGY

- # 14 How do you standardize $CH_4$ emissions in your organization?

  *- "scf", "Nm3", "t/yr", "EPA 21", "EN15446", "CO2e", "BAT", "FID" ..*

- # 15 Is the $CH_4$ emissions standardization mandated by law?



# Evaluation of $CH_4$ Survey

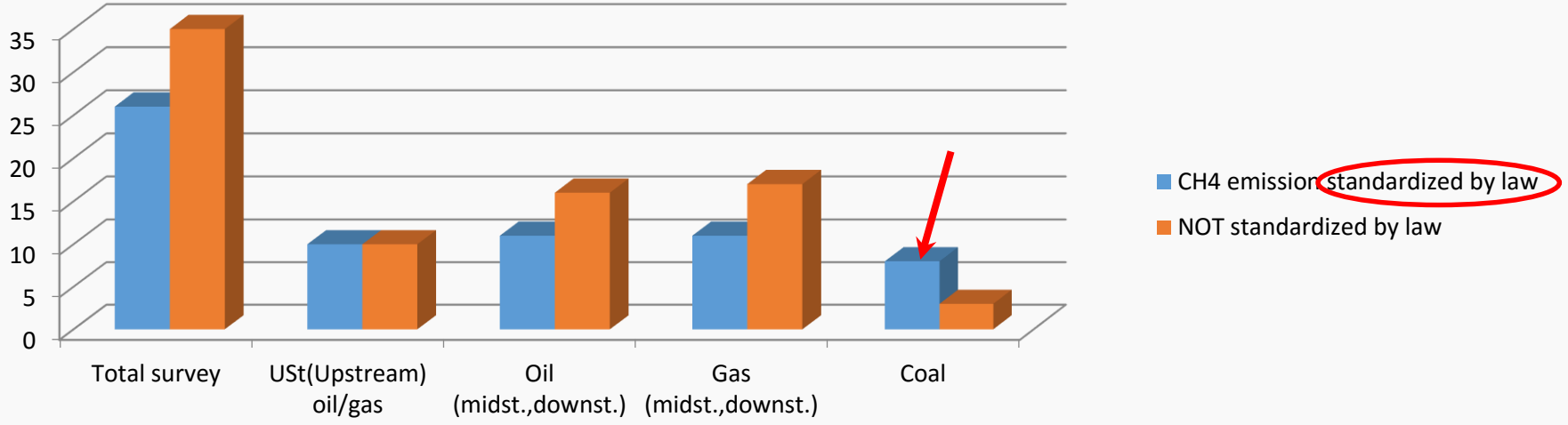
## Emissions Monitoring 2017

ENERGY

- # 14 How do you standardize $CH_4$ emissions in your organization?

  *- "scf", "Nm3", "t/yr", "EPA 21", "EN15446", "CO2e", "BAT", "FID" ..*

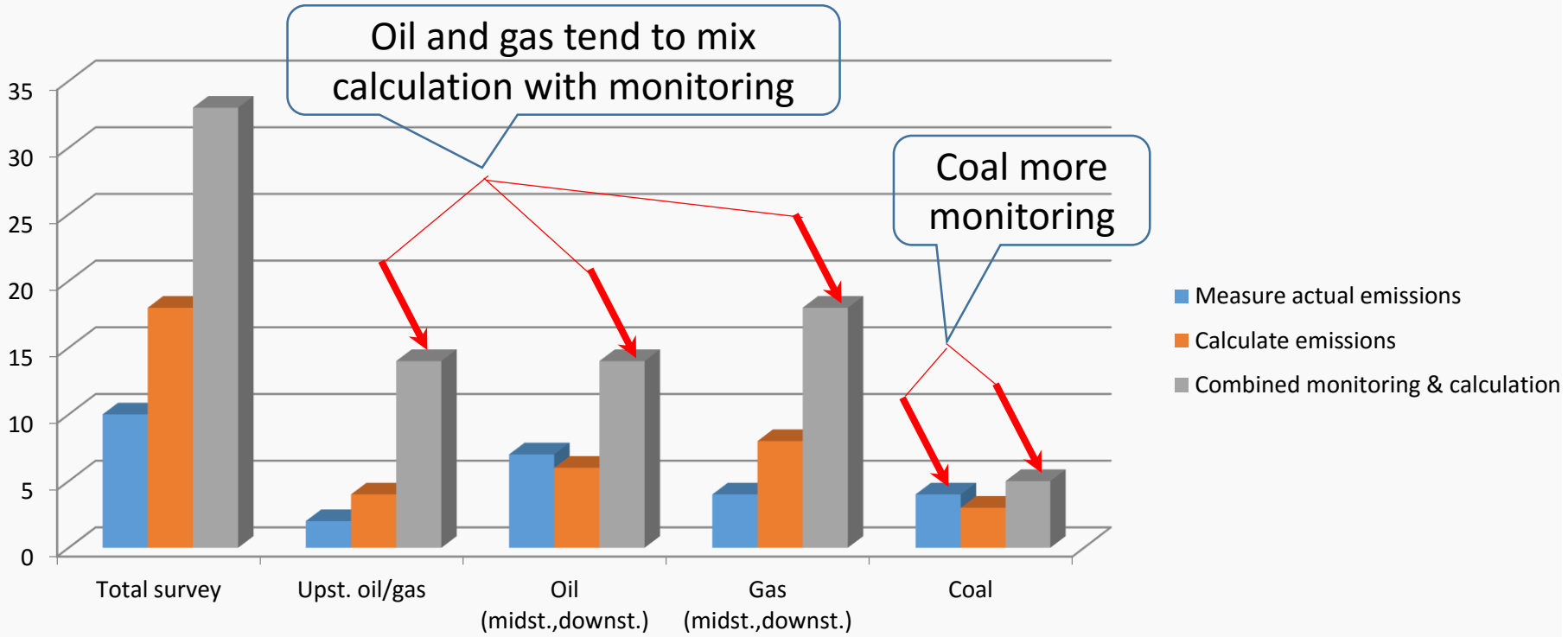
- # 15 Is the $CH_4$ emissions standardization mandated by law?



# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

- # 16 What methods/technologies are used to monitor $CH_4$ emissions?

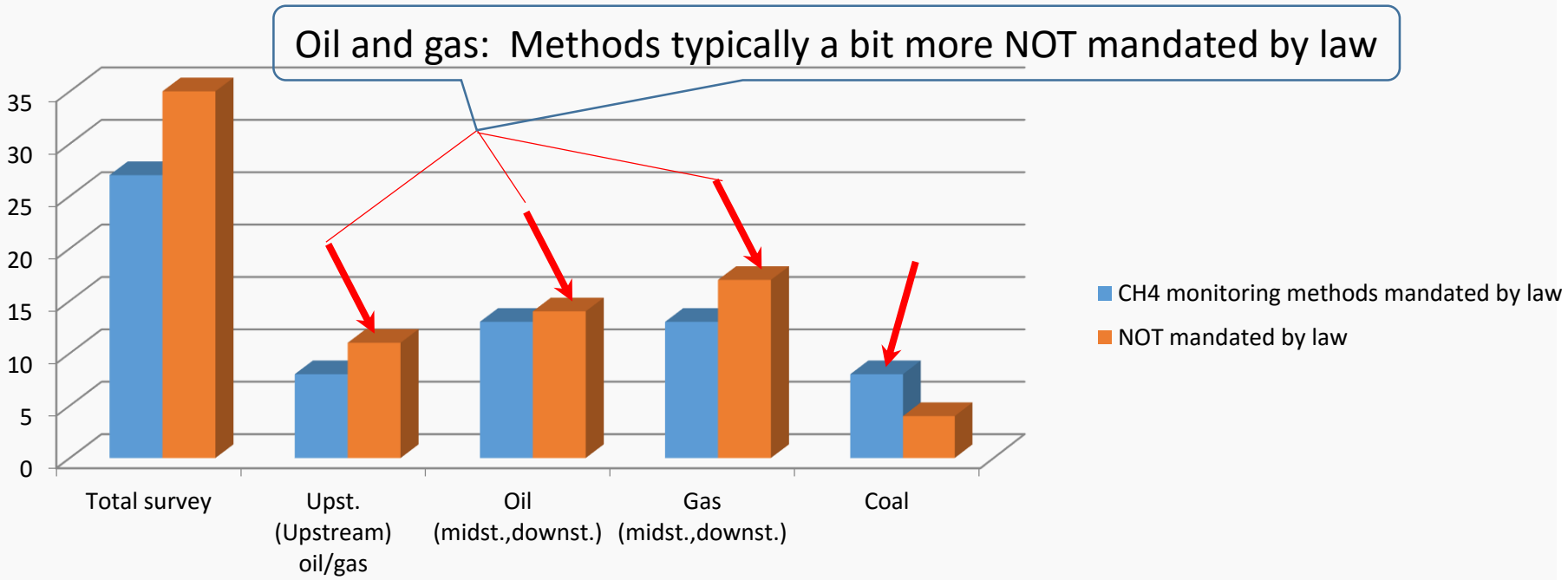


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 17 Are the methods/technologies mandated by law/regulations?



# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

*# 18 -19 are too wide spread to present in graphic form.*

- #18 Why are these methods chosen?

  - "Best suited", "no other tool", "EPA 21", "Low cost technology", "used by others", "BAT", "Best practice" ..

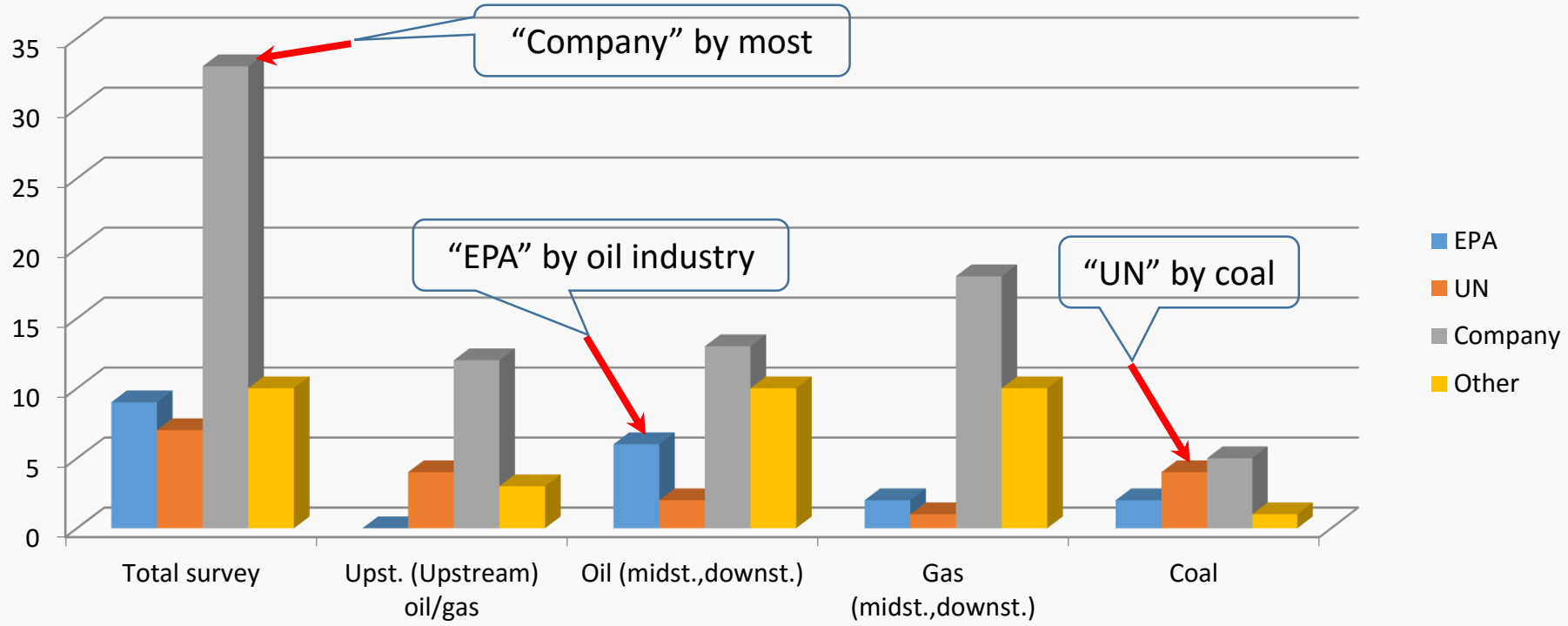
- # 19 What % of $CH_4$ emissions are included in a "Maximum Allowable Emission Target" ?
  - 9 respondents answered in numbers (from 0% to 100%)
  - 2 respondents referred to different per facility (one said ½% to 1½%)
  - 25 responded NA or that they did not understand the question
  - Remaining 43 (over half) did not respond at all

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 20 When using emission factors for calculations, what database(s) do you use?

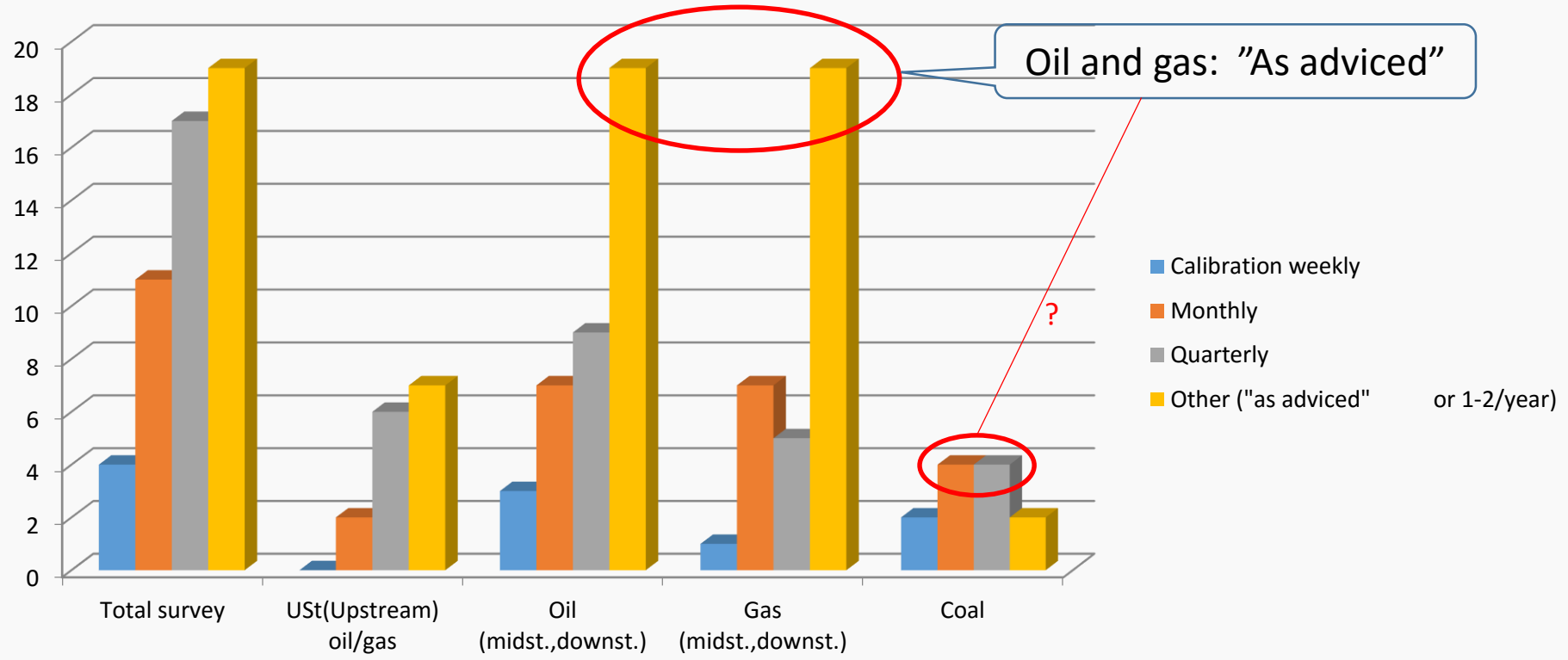


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 21 How often is the monitoring equipment calibrated?

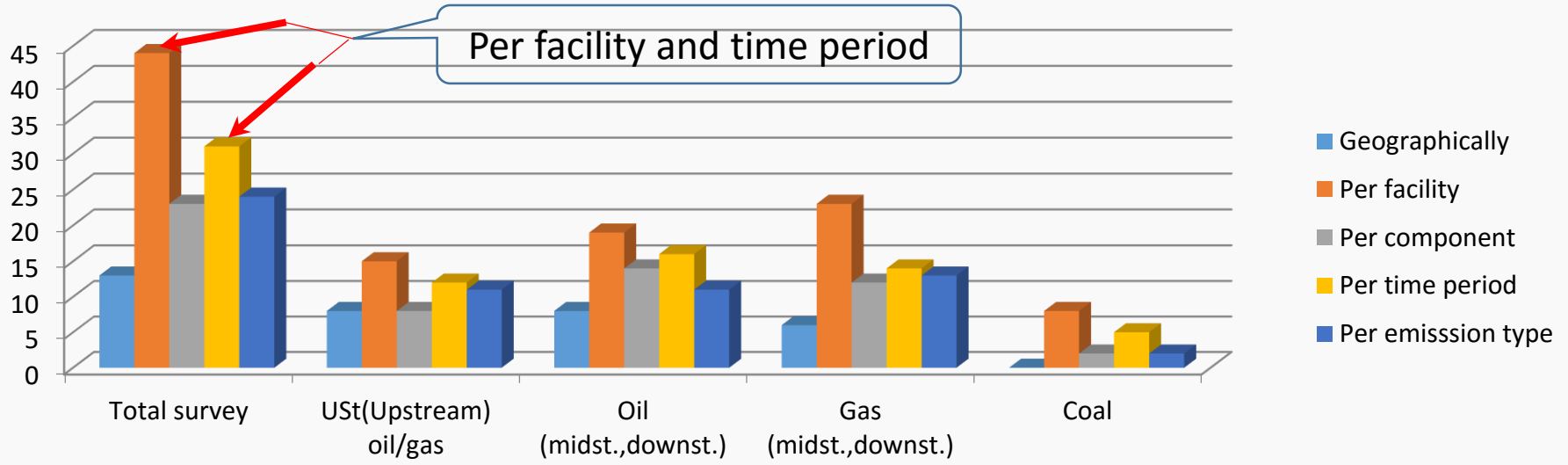


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 22 How are monitoring results recorded?



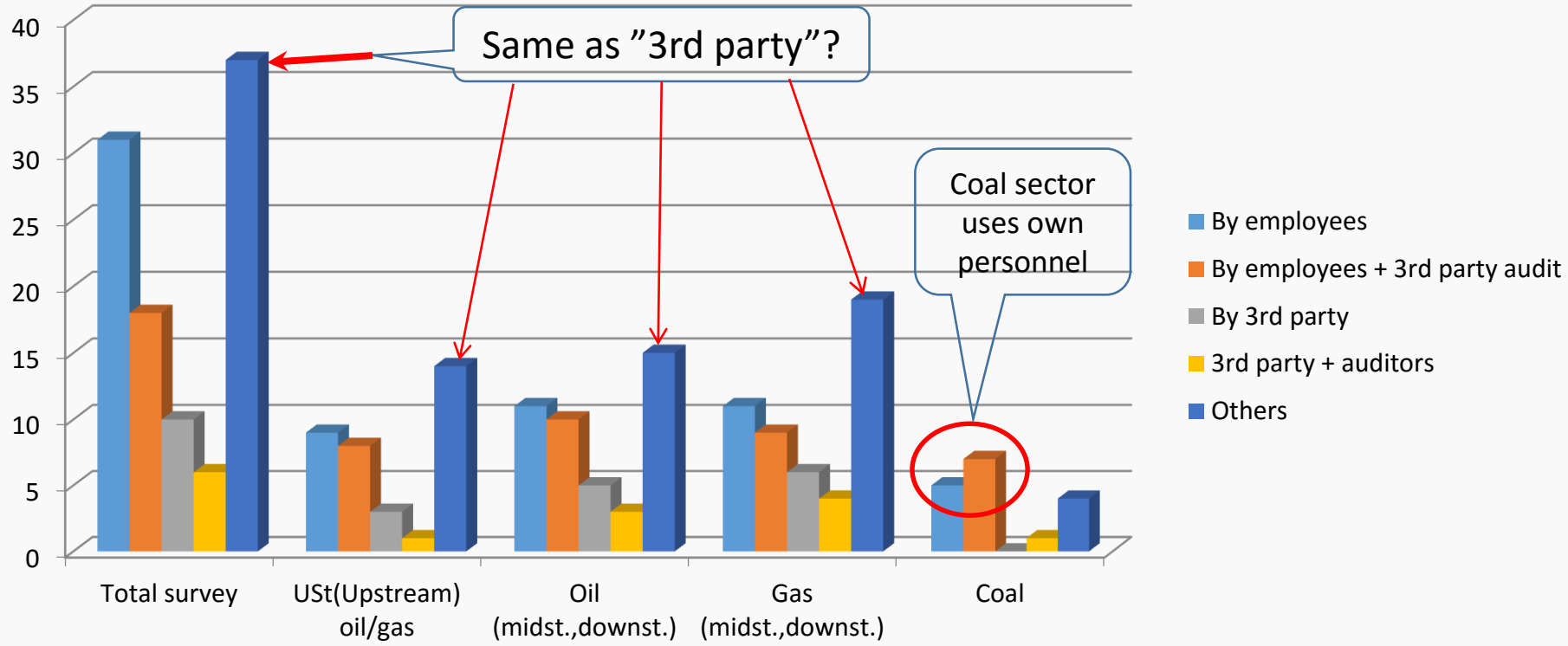

- # 23 How are monitoring results recorded?
  What units are used to record the results?
  - More than half did not answer.
  - Rest answered various volume, rate or flow units, mostly SI-units.

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 24 How are surveys conducted?





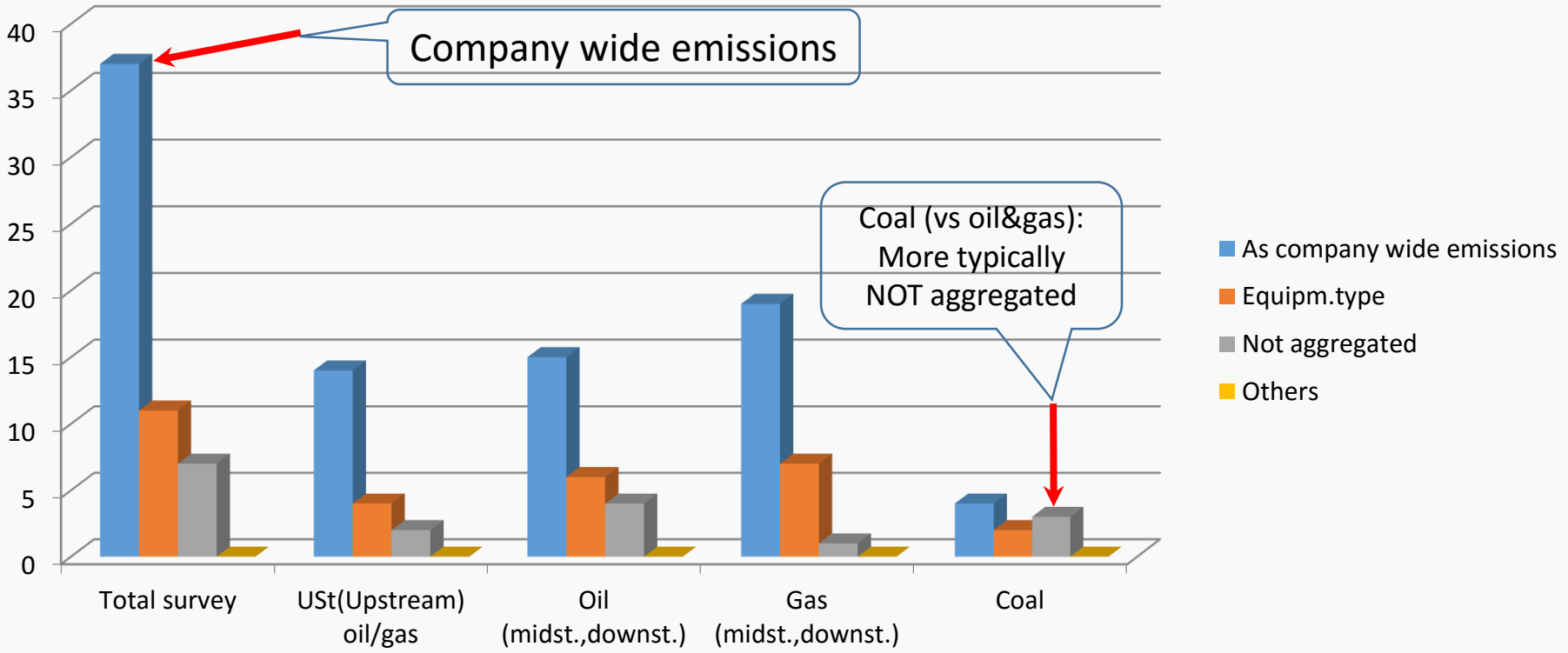

UNECE

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 25 How are the results aggregated?

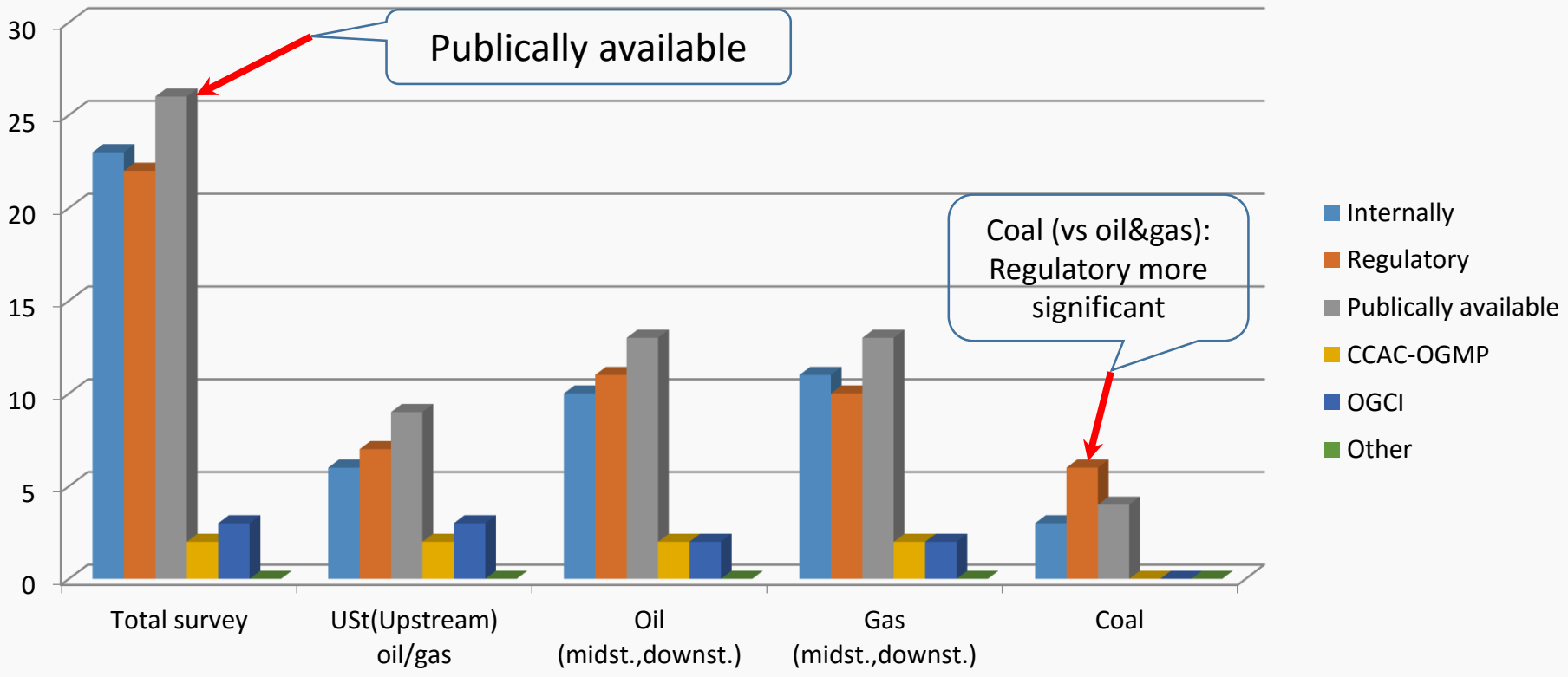


# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 26 How are your results reported?



# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 27 What organisations do you cooperate with on this topic?

  Around half of respondents indicated a wide range of names, including;

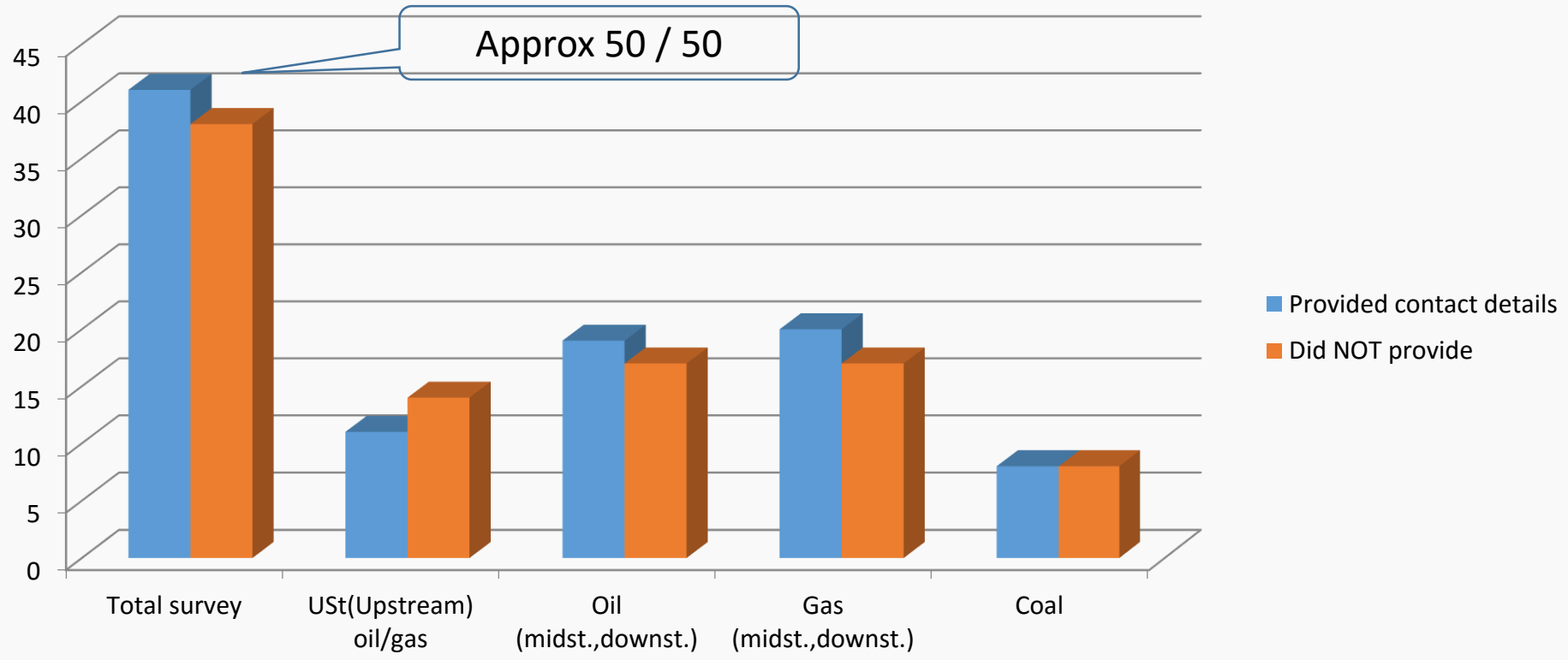
  - Governmental ministries and agencies
  - Intergovernmental organisations (e.g. UN and GMI, Global Methane Initiative)
  - Universities and research institutions
  - 3rd party auditing companies and
  - Other private companies

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- # 28 Contact details (full name and email address) submitted?



# Survey on methane management in the extractive industries

## Findings and conclusions

- Most fossil extractive industries (gas, oil, coal) monitor $CH_4$ and report results
- Primary purposes for monitoring are compliance and safety
- The nature of emissions are fugitive leaks and controlled releases (mainly for gas and oil industries) and accumulation of gas (coal)
- Oil and gas exploration distinguishes $CH_4$ from other CH-gases. Other players do not distinguish
- Continuous monitoring is applied in all sectors, but especially in coal, plus monthly for coal and annually for oil and gas
- $CH_4$ emission standardization mandated by law more often for coal than for oil and gas

# Evaluation of $CH_4$ Survey

## Emissions Monitoring 2017

ENERGY

- OVERALL SUMMARY AND CONCLUSIONS

*(Assuming that the response group is representative;)*

| Survey item | Oil & Gas Exploration | Oil & Gas Distribution | Coal |
|---|---|---|---|
| Mostly monitored | Yes | - And calculated | Yes |
| Primary purposes (for monitoring) | Safety | Compliance | Safety |
| Emissons are primarily from | -Fugitive leaks<br>-- Controlled releases | | Accumulation |
| Methods/technologies for monitoring are mandated by law | Somewhat | | Yes |
| $CH_4$ emissions are typically monitored by .. | 3rd parties | | Own personnel |
| Recorded $CH_4$ emissions are typically reported | To be publically available | | For regulatory purposes |

# Methane Management in the Extractive Industries

ENERGY

- Reducing methane emissions would slow global temperature rises.

**BUT**

- Current information is largely based on estimates, and often uneven and incomplete.
  - Not all companies measure and report leaks.
  - Technology for detecting and quantifying methane emissions is available.
  - Standard national/regional methods for reporting them exist
  - Implementation is uneven, so hard to compare data.

**THEREFORE**

- A clear need for common global approaches across each fossil energy chain and for enhanced dialogue and cooperation.

# Key Takeaways from GEG session March 2017

- Methane management is attracting attention
- Information regarding methane emissions has improved
- Much effort and resources are going into remediation
- A range of practices exist

**BUT**

- The essential conclusions remain unchanged:
  - **Data collection is not rigorous nor comprehensive; estimates not verified**
  - **Procedures for MRV (Monitoring, Reporting & Verification) and remediation are variable**
  - **Enormous opportunity for knowledge enhancement and remediation**

# Conclusions and Recommendations from GEG

- Survey identified critical gaps in information on methane emissions.
  - It was recommended that work on best practice guidelines and methods to manage and reduce methane emissions be continued in the 2018–2019 work plan.

- Survey highlighted the importance of and practical need for steps to be undertaken to update and refine data to reflect more accurately volumes of methane emissions from the gas sector.

- Future work should be carried out in close collaboration with the International Gas Union as well as with other international mechanisms, companies, organizations and associations, and invited all interested parties to join this effort.

UNECE

ENERGY

# Thank you!

Richard Mattus
Consultant
**UNECE**
Date 27 I 09 I 2017, Geneva