performance management | consulting | technology

Nuon Project VolaRe

How to develop metering data management & energy balance reporting

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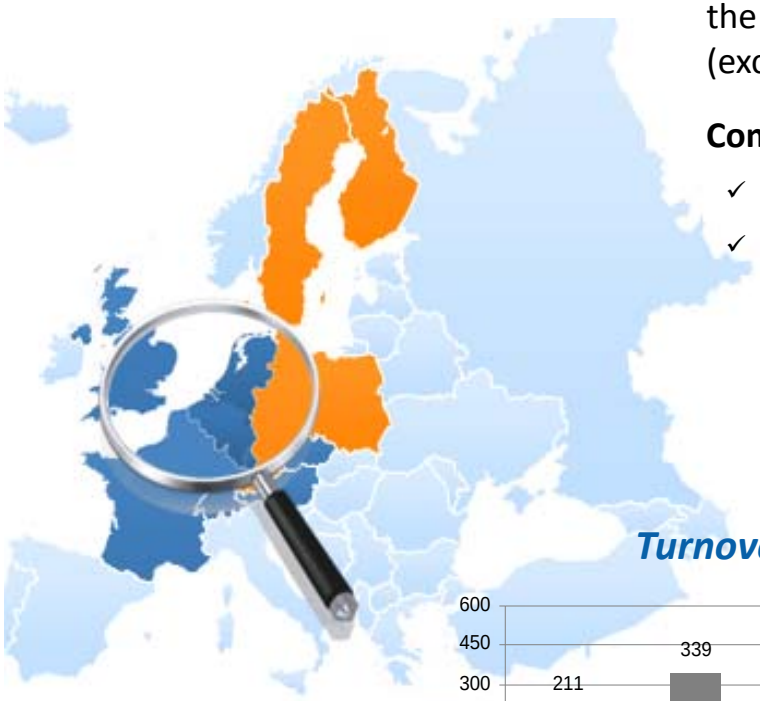
Agenda

- Nuon Belgium, a Vattenfall company
- Business needs for the project VolaRe
- Project approach
- VolaRe solution
- Lessons learned

Nuon in Belgium: most successful newcomer on the market

Nuon aims for a market share of +10% by establishing long-lasting partnerships with customers

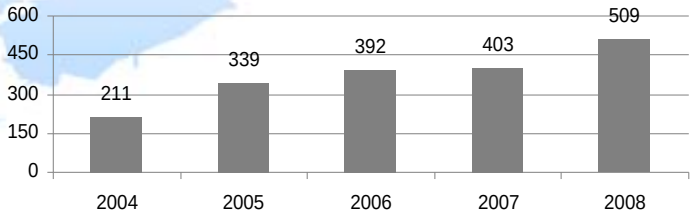


Nuon Belgium has been operating on the **Flemish market since 2002** and in the **Walloon and Brussels** market **since 2004**, employing directly 148 FTE (excl call centre)

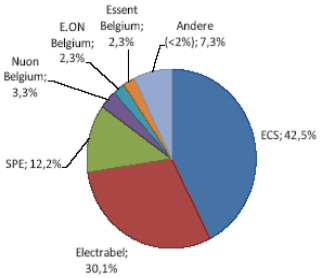
Commercial position:

- ✓ 300,000 electricity connections, ~ 2.7 TWh (5,3% market share)
- ✓ 170,000 natural gas connections, ~ 3.4 TWh (5,8% market share)

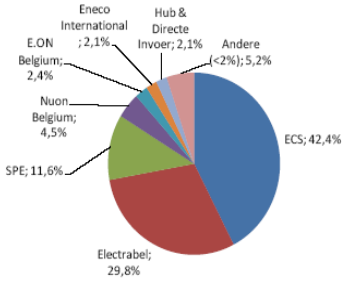
Turnover (mio €)



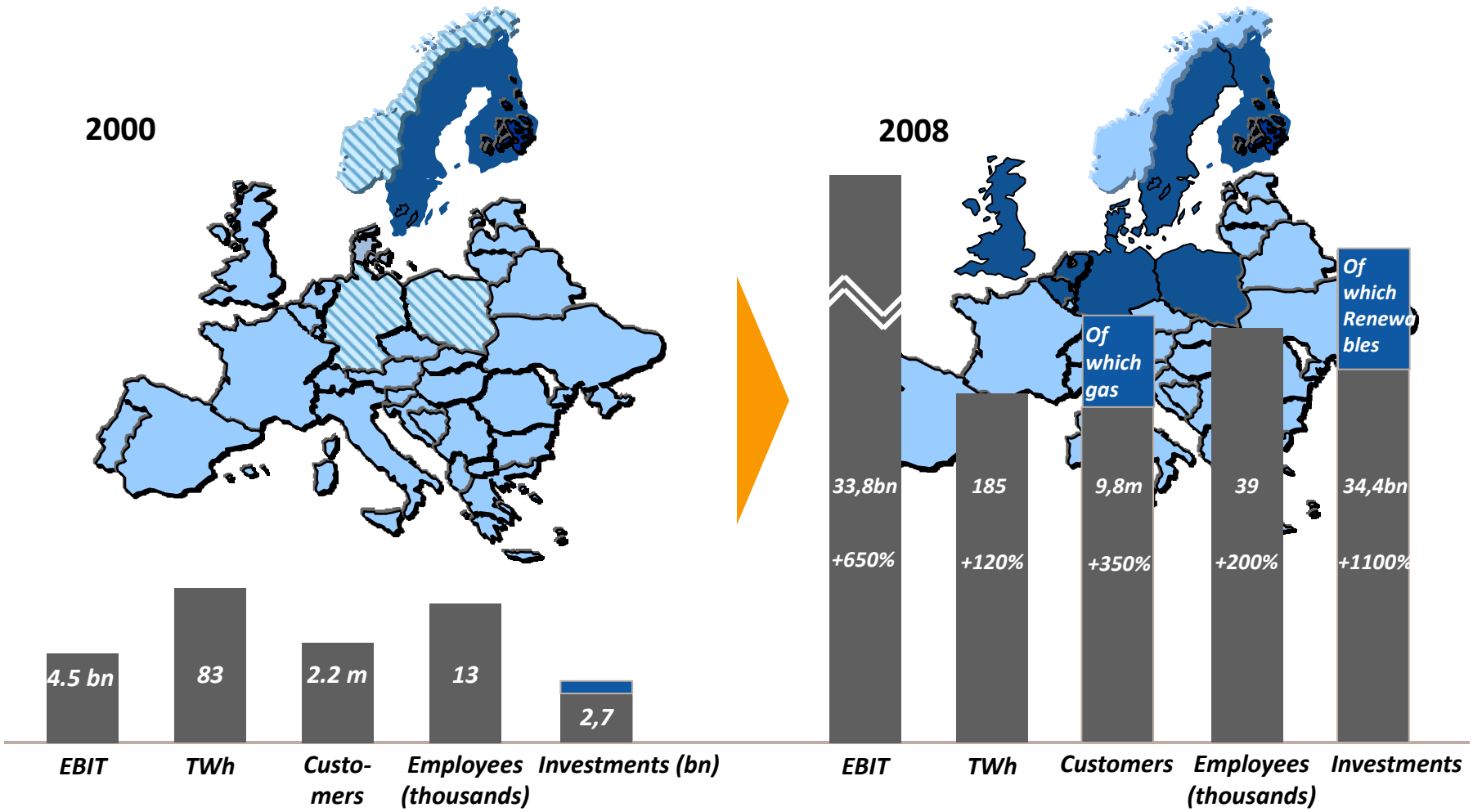
Market share Belgium (delivered volume)



Market share Flanders (delivered volume)



Vattenfall has grown to become a leading European energy company



Vattenfall's strategic vision results in strong market positions

Mission

To enhance our customers' competitiveness, environment and quality of life through efficient energy solutions and world class service

Vision

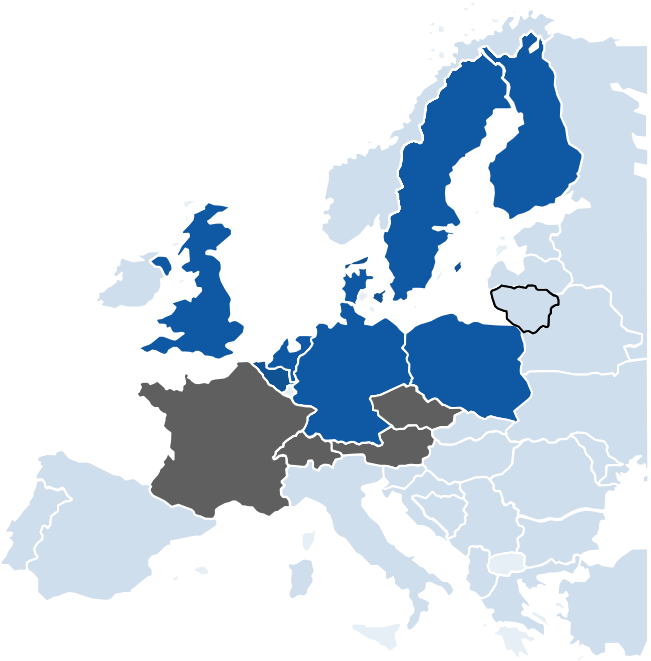
To be a leading European energy company

Strategic Direction

Making Electricity Clean

Core Values

Effectiveness, Openness, Accountability



8 core markets

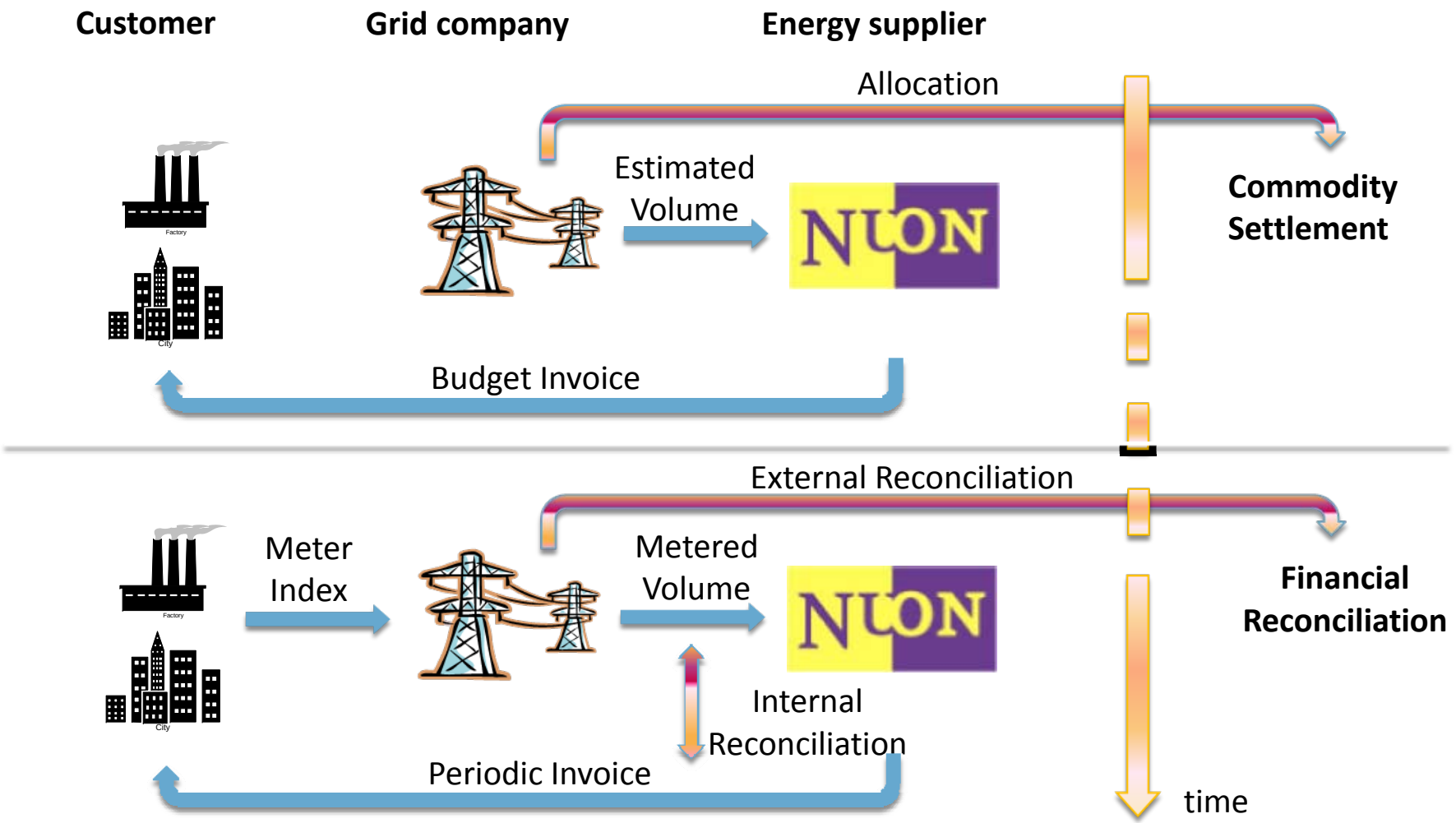
4 target markets

	Sweden	Finland	Denmark	Germany	Poland	Belgium	Netherlands
Electricity generation	1			3	7	n/a	3
Electricity trading	Top 3						
Electricity distribution	2	2	n/a	4	5	n/a	n/a
Electricity sales	1	3	n/a	4	5	3	2
District heat	4		2	1	1	n/a	2
Retail gas sales	n/a	n/a	n/a	n/a	n/a	3	1

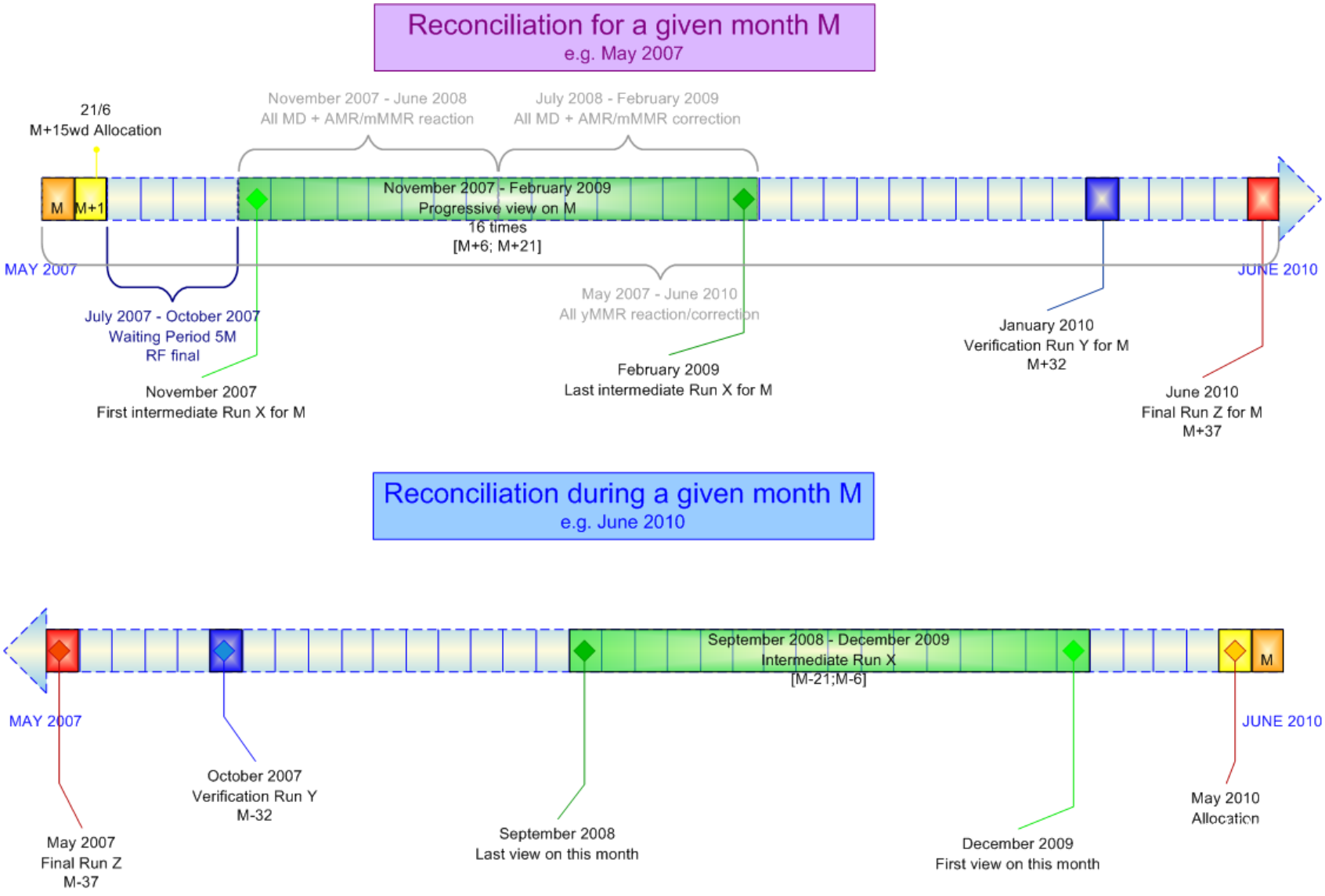
Business needs for the Project VolaRe

- Implementation of the first iteration of the new Nuon Belgium financial reporting tools, called 'VolaRe‘ - 'Volume and Reconciliation'
- Functional scope of VolaRe:
  - Implementation of the reporting of the following energy volumes: Estimated Volume, Metered Volume, Budget Invoice Volume, Periodic Invoiced Volume, Allocation and External reconciliation volume
  - External and Internal reconciliation, based on the new Belgian market model to be live in April 2010 (MIG 4)
  - Standardization of the volumes
- Technical scope of VolaRe:
  - Creation of a new data warehouse for Nuon Belgium

Energy volumes on Belgian Energy market



New Belgian Reconciliation model (MIG 4)



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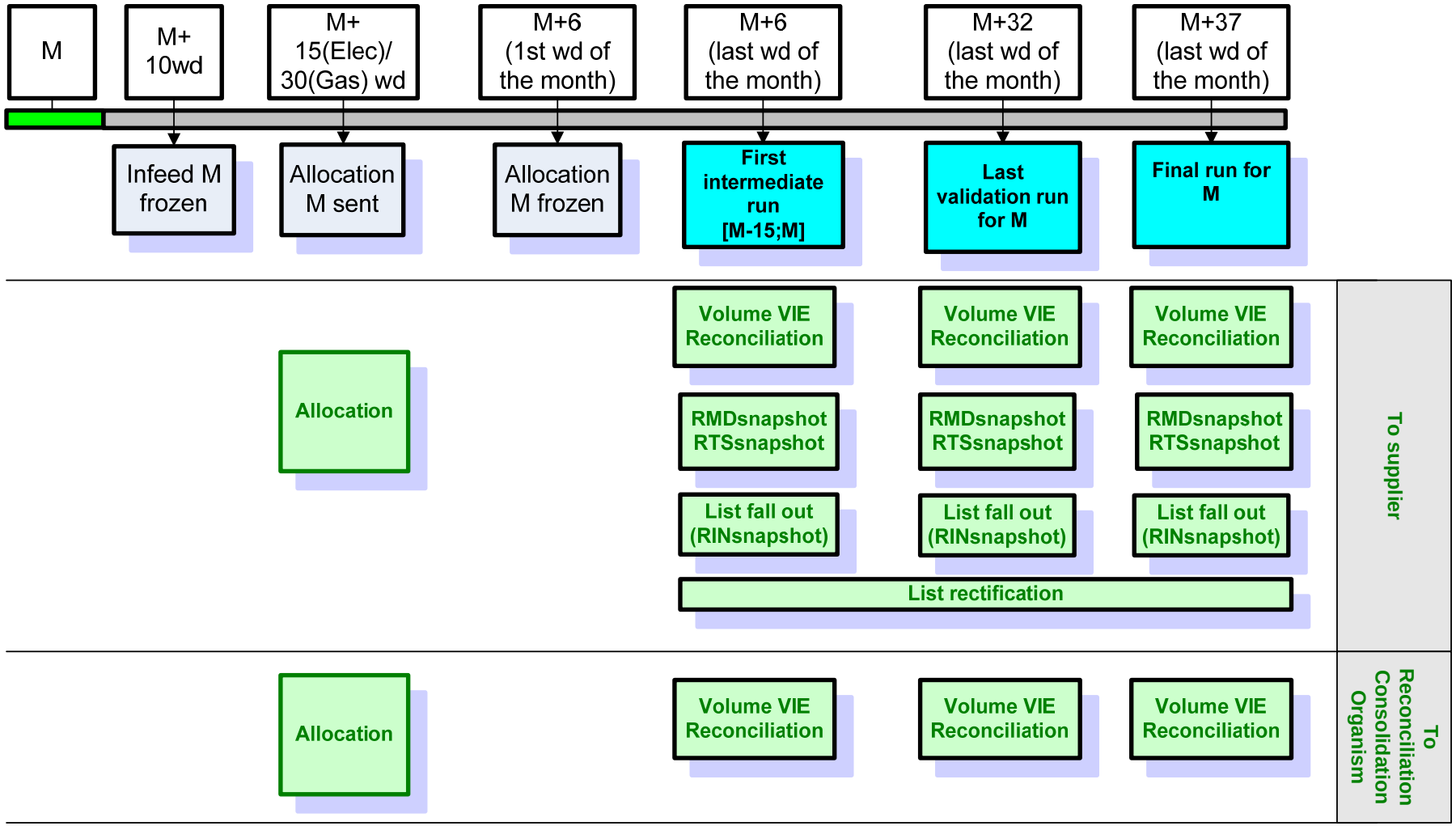


Wd : Working day

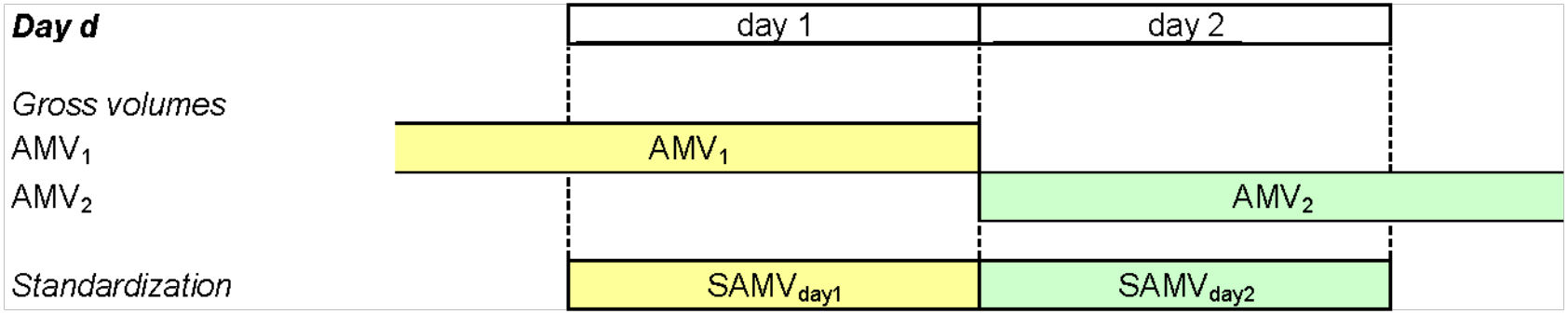
Source: UMIX

Volume standardization

- Principles
  - Each gross volume is recalculated for each day of the period delimited by a start date d1 and an end date dn
  - The recalculation can vary according to the meter reading frequency of the access point
  - The recalculation is based on following timeseries per 15’ or per 1h:
    - Synthetic load profile (SLP)
    - Climate correction factor (KCF)
    - Residue factor (RF)
  - The recalculation is done per tariff period

Volume standardization

- Graphical representation:



- Example of a formula: Standardized Actual Metered Volume (SAMV)
  - Yearly and monthly metered access points:

$$SAMV^{r}_{c(d)} = \frac{AMV^{r}_{c(d)}}{\sum_{t=d_1}^{d_{n-1}} \left(SLP_t \times KCF_t \times RF_t\right)} \times \sum_{t \in d} \left(SLP_t \times KCF_t \times RF_t\right)$$

  - Continuously metered access points: $SAMV^{TP}_{c(d)} = AMV^{TP}_{c(d)} = \sum_{\substack{t \in d \\ t \in TP}} AMV_{c(t)}$

Volume standardization (example)

From (d1)	25-Dec-08
To (dn)	19-Jun-09
kWh	5600

Step (1) The grid company validate the index and calculate the metered volume

$$"EAV"^{r}_{c(d)} = \frac{AMV^{r}_{c(d)}}{\sum_{t=d_1}^{d_{n-1}} (SLP_t \times KCF_t \times RF_t)} \times \sum_{t \in year} (SLP_t)$$

Step (2) The calculation of an Estimated Annual Volume based on SLP, KCF and/or RF weighting factor

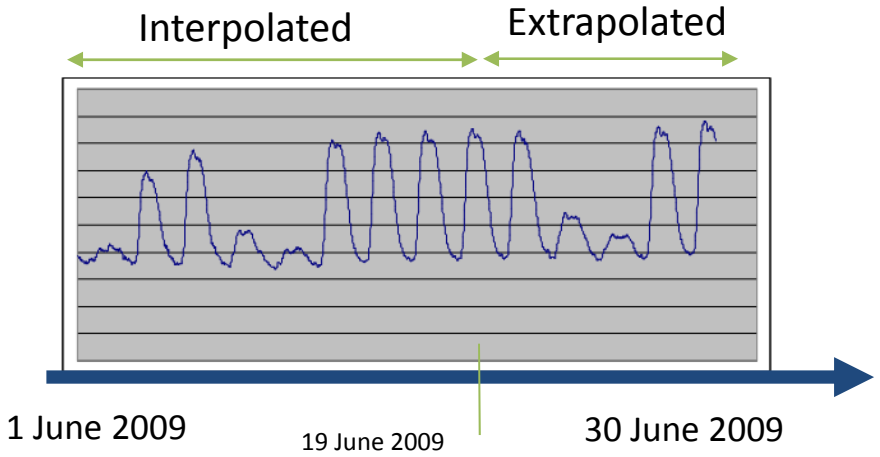
$$SEV^{r}_{c(d)} = EAV^{r}_{c(d)} \times \sum_{t \in d} (SLP_t \times KCF_t \times RF_t)$$

Step (3a) The consumption is extrapolated per day d

$$SAMV^{r}_{c(d)} = \frac{AMV^{r}_{c(d)}}{\sum_{t=d_1}^{d_{n-1}} (SLP_t \times KCF_t \times RF_t)} \times \sum_{t \in d} (SLP_t \times KCF_t \times RF_t)$$

Step (3a) The consumption is interpolated per day d

	Period	Value
SLP*KCF*RF	[25-Dec-08,19-Jun-09[	0,56447108
"EAV" (kWh)	**na**	**9920,79**
SLP*KCF*RF	[1-Jun-09,18-Jun-09]	0,05900129
SLP*KCF*RF	[19-Jun-09,30-Jun-09]	0,02099871
SAMV	**[1-Jun-09,18-Jun-09]**	**585,34**
SEV	**[19-Jun-09,30-Jun-09]**	**208,32**



Project Approach

- RFP Procedure
  - After 2 months of RFP procedure, Nuon chooses Keyrus as IT partner for developing the technical solution

- Keyrus
  - Set up in 1996
  - 1,237 employees worldwide - 100+ consultants in Belgium-Luxembourg
  - Single focus on Business Intelligence and Performance Management
  - Active in a wide range of sectors
  - Specialised consultants in utility business with experience at Electrabel, Luminus, Elia, Umix...

Project Approach

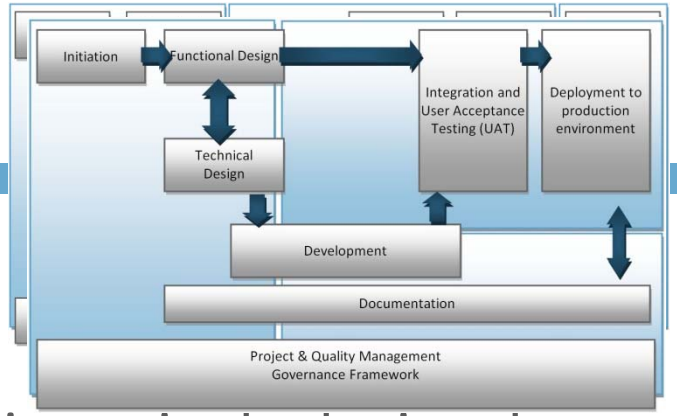
- Keyrus adopts a unique positioning in its market through
  - a single focus on Business Intelligence and Performance Management
  - multi-industry and multi-functional coverage with strong ability to understand true business issues
  - end-to-end capabilities over two major dimensions
    - Across the entire BI/PM framework, from Information Management to Corporate Performance Management
    - Across the entire BI/PM project/program lifecycle, from initiation, to implementation and to performance continuity
  - strong delivery capabilities by combining experienced consultants, proven methodology & significant track records
  - agile, pragmatic and result-oriented approach

Project Approach

- Major challenges
  - Huge amount of data to be daily process
  - Complex transformations and calculations
  - The ETL procedures must be uniform and integrated in the pre-existing Microsoft SSIS and SQL Server 2008 environment
  - Short elapsed time due to legal reporting constraints

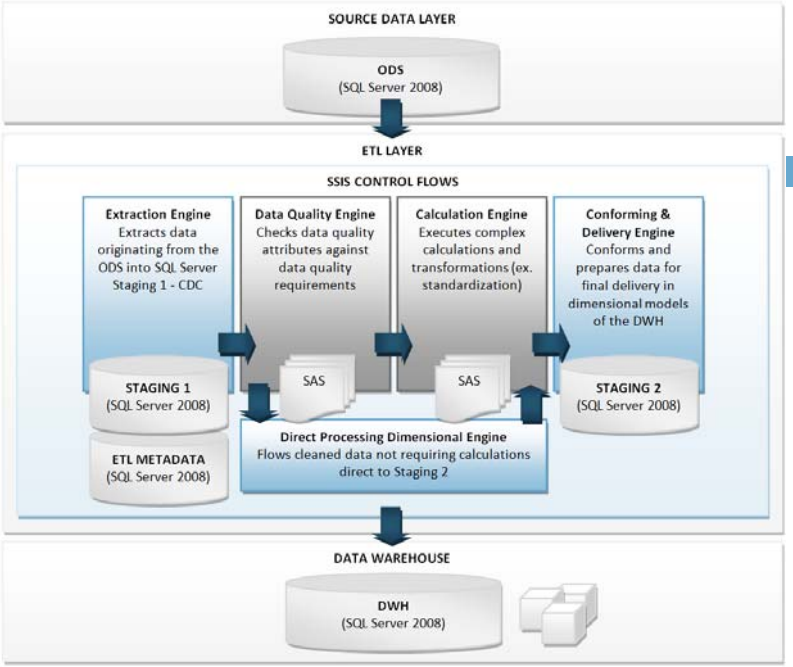
- Driver for
  - applied methodology
  - proposed solution

Methodology



- Methodology framework based on experience in deploying data warehouse solutions
- Adaptation required to tackle all challenges
  - Usage of a lot of parallelism in the project development life cycle
  - Increase focus on project governance
    - Close communication at all levels incl. management during the whole project lifecycle
    - Close follow-up of the planning
    - Regular mixed team meeting
  - Use of multi-skilled consultants with
    - technical knowledge of both SSIS and SAS
    - business knowledge of the utility market and especially the volume standardisation process

VolaRe Solution



- Introduction of SAS within SSIS framework
- SAS
  - ETL performance & complexity
    - simplify complex transformation
    - optimizing techniques and IO capabilities
  - Development cost
  - Elapse time
  - Scalability
- Microsoft SSIS
  - Centralised control of the loading process
  - Centralized meta data management
  - Management of SCD and all loading procedures into DWH tables
  - Extraction the data from the source system

Lessons learned and project review

- Project delivered the full scope
  - on time : April 2010, 5 months after the start of the project
  - on budget: 64 md (Nuon) + 147 md (Keyrus)

- Internal reconciliation report is currently in use to track the revenue leakages within Nuon Belgium; an extended version is already foreseen

- Scalability: we already developed financial reporting on the existing solution at reasonable cost

Thank you for your attention…

questions?