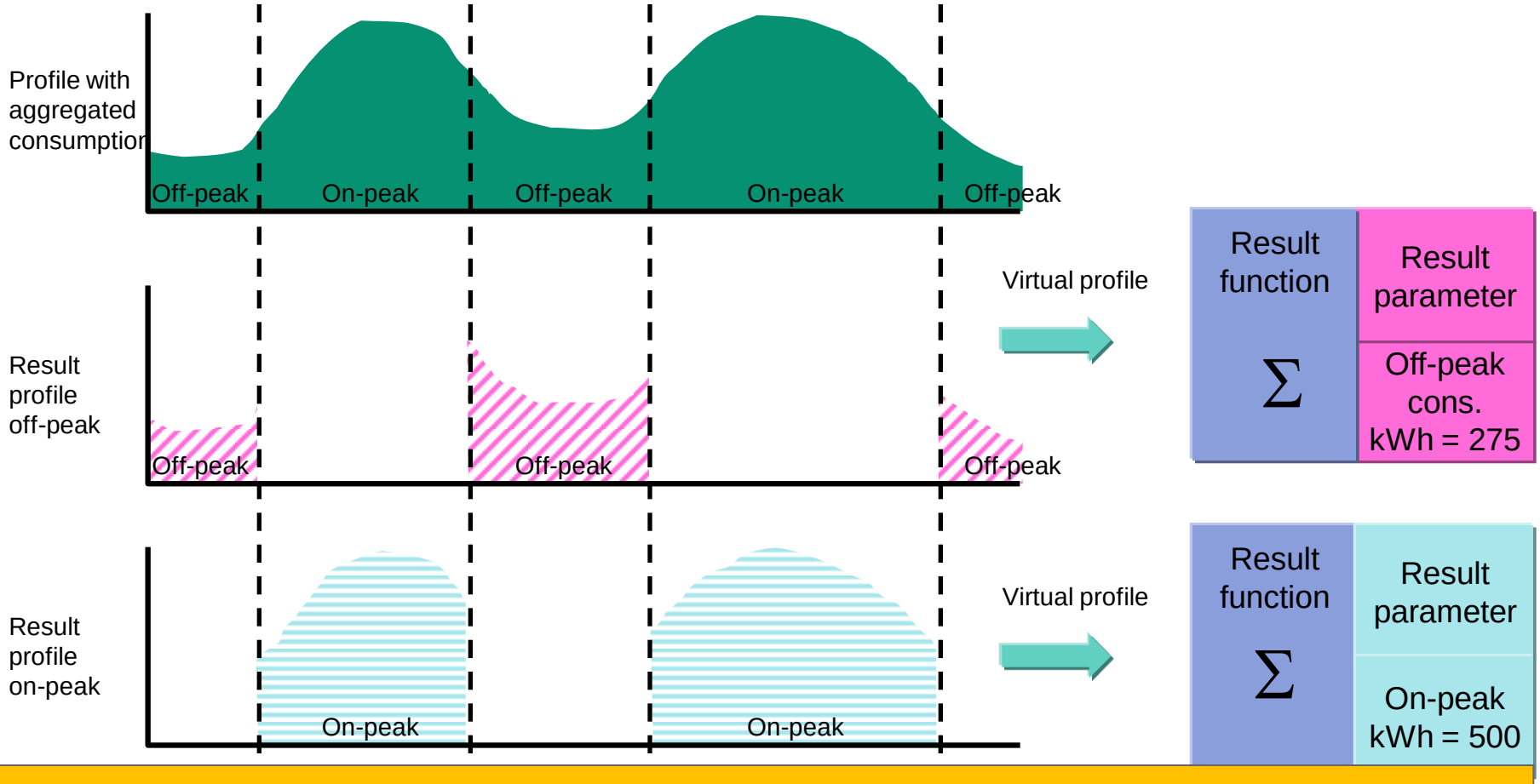
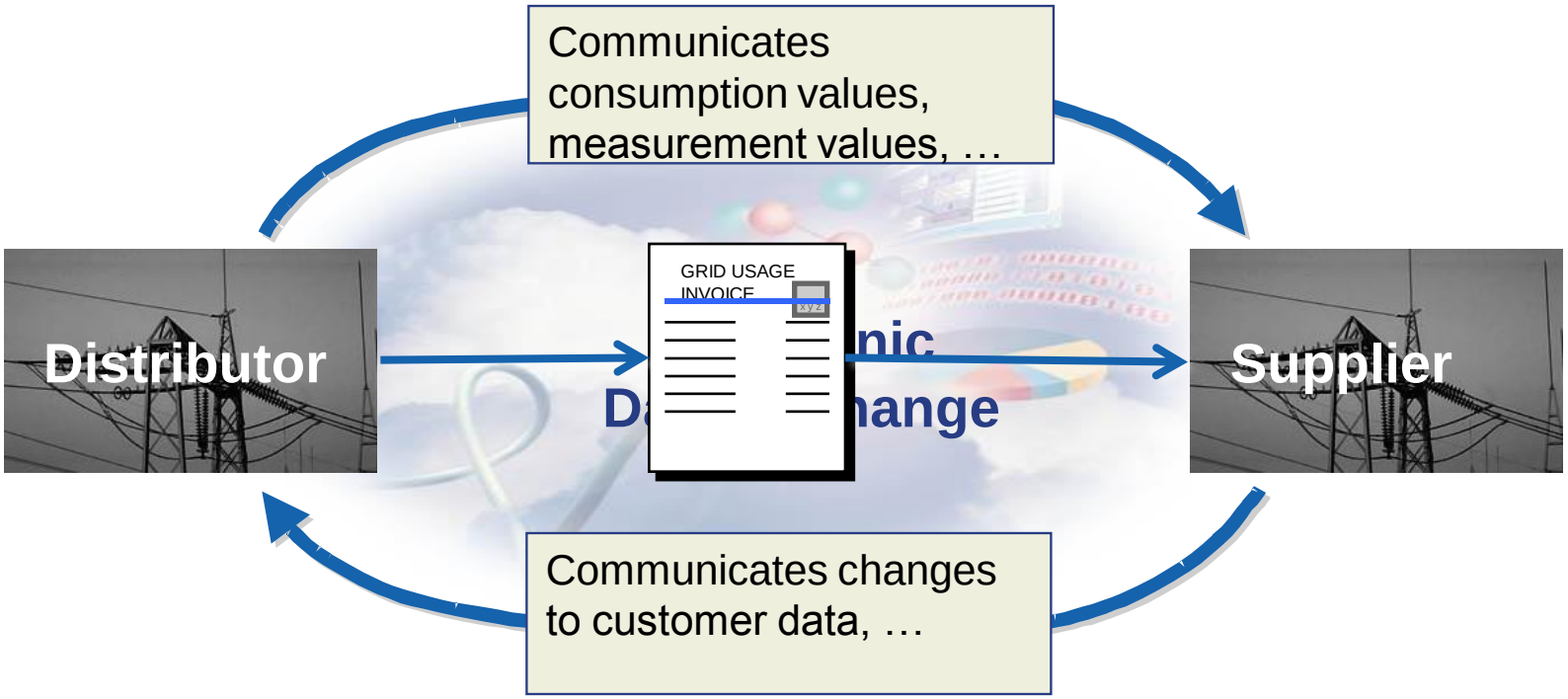
3rd step:
Perform RTP-Billing & Invoicing



The pre-aggregated consumption values (time series) and the numbers of PoDs (time series) are evaluated with regard to on-peak consumption, off-peak consumption and the average number of PoDs. These values are billed and the billing document is invoiced.

4th step:
Send Electronic Invoices



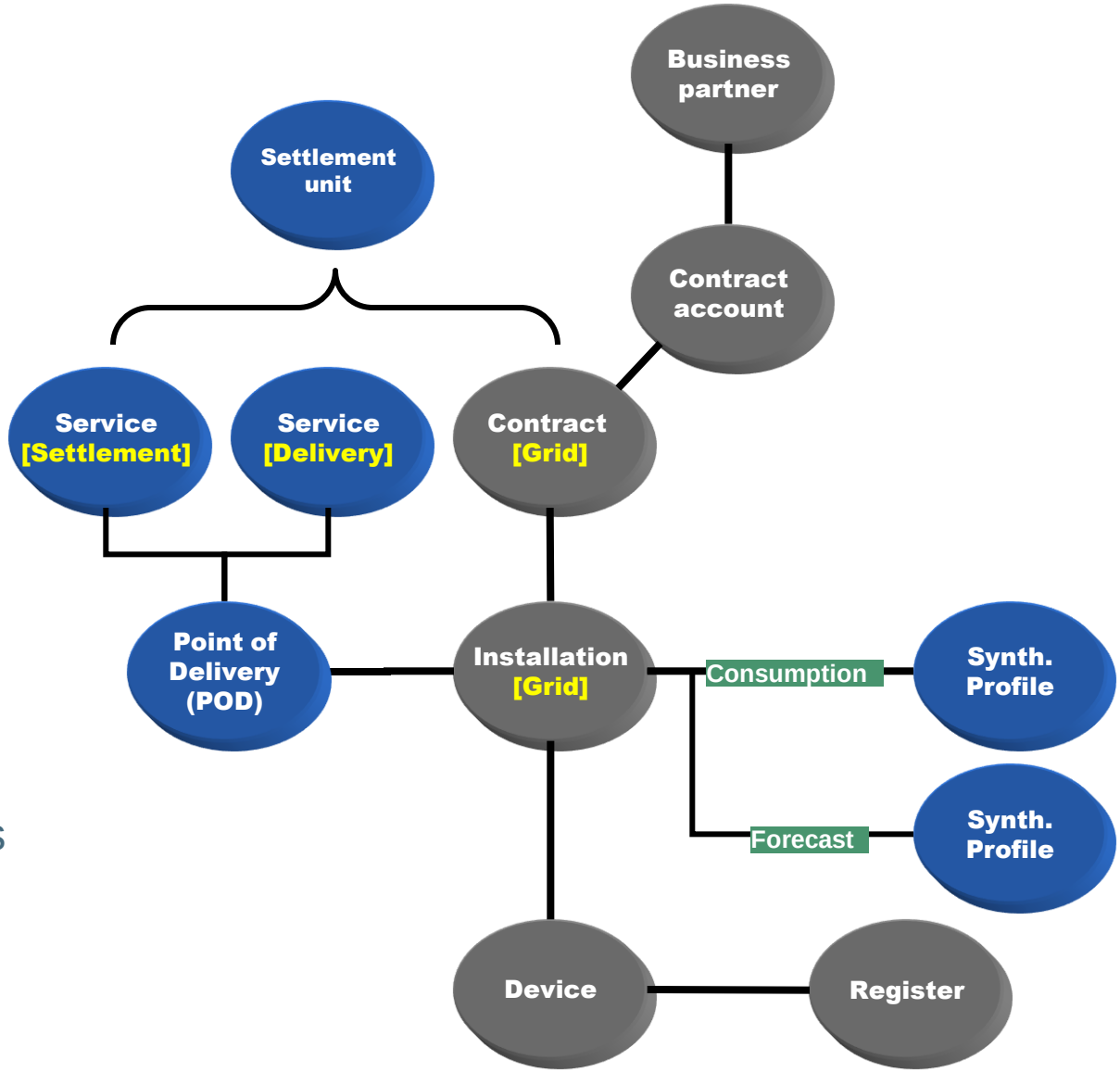
The Grid Usage Invoice is sent to the Supplier by Electronic Data Exchange

Agenda

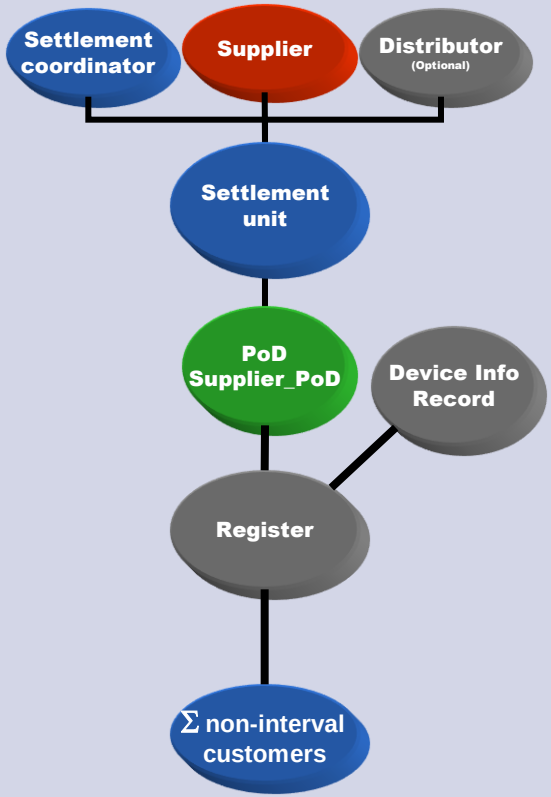
1. Introduction & Motivation
2. Process Steps
3. **Data Model & System Preparation**
4. Summary and Outlook
5. Appendix

Residential Customers – Data Model

- For each consumer and his related installation an assignment to a customer group is performed using synthetic load profiles.
- The usage factors for load profiles are updated whenever consumption data are calculated.
- There exist usage factors for past periods and forecasted usage factors for future periods.

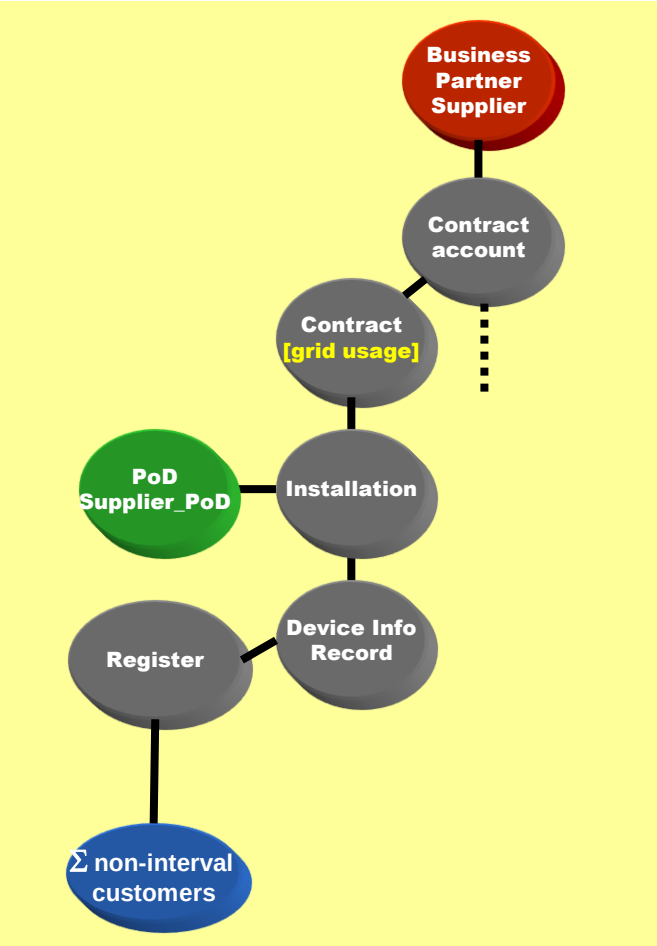


Supplier – Settlement View



- A settlement unit is needed for each supplier the distributor wants to create a grid usage bill for.
- This settlement unit groups all points of delivery of the customers of this supplier.

Supplier – Billing View



- For each supplier that the distributor wants to bill a complete IS-U data construct needs to exist.
- The installation refers to a RTP interface allowing the billing of profile data which are assigned to the corresponding register.

System Preparation

- **Data Collection**
  A new settlement process has to be defined. This includes new settlement parameters and settlement steps for
  - aggregating consumptions (usage factors)
  - counting points of delivery
  - sending the results to the BS
- **Grid Usage Billing**
  In order to process pre-aggregated consumption data and number of PoDs a new RTP Interface has to be defined. This includes the definition of a new formula and a new result function.
- **Rate**
  In order to use the RTP interface within billing, new rates have to be defined that are based on the output parameters of the RTP interface.
- **Usage factor**
  In order to update the usage factors as soon as meter reading data (consumption data) are changed, an exit function has to be enhanced.

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Summary and Outlook

- The procedure presented here is easy to implement
- It reduces data traffic significantly
- It does not need individual bills nor individual invoices
- It does not need individual (costumer) contract accounting and…
- It leads to the same financial result!
- It reduces the TCO

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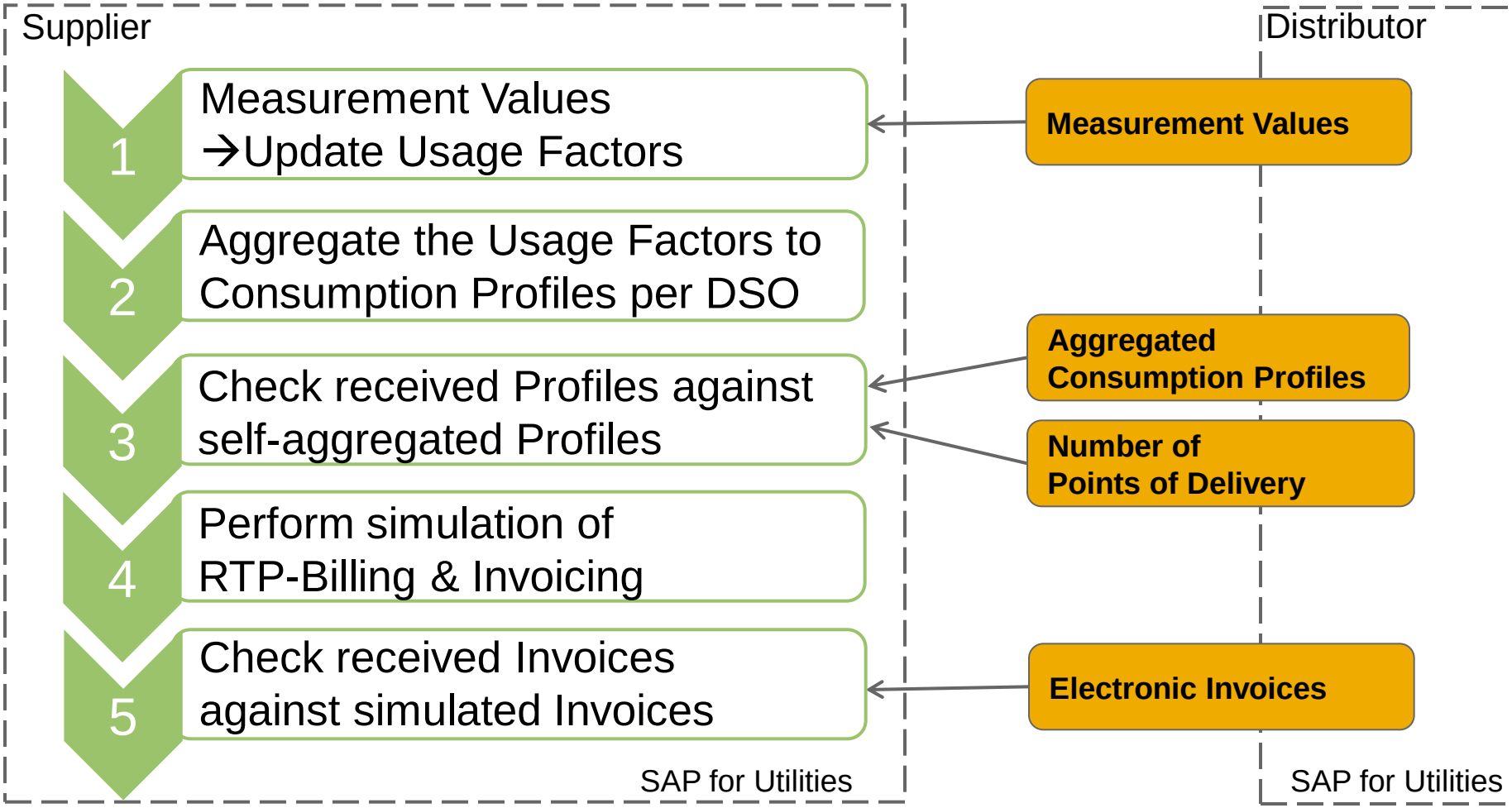
   - Results of Country Observations

Grid Usage Billing on Supplier Side
Process Steps



Layout for Customer Invoice

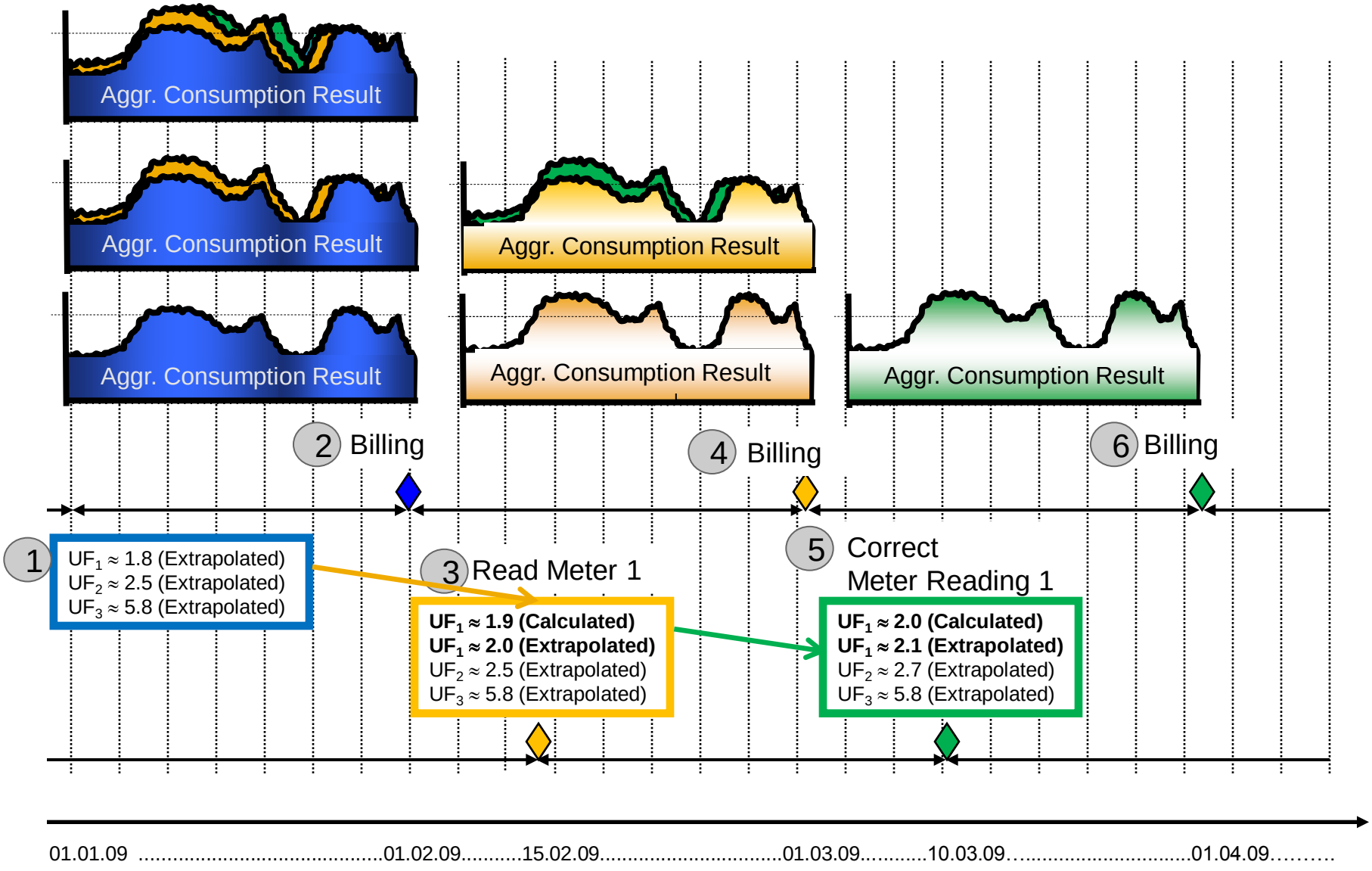
YOUR TARIFF INFORMATION

TARIFF NAME	DAY&NIGHT FIX	
	Week days (Mon-Fri 6 am-10pm)	Nights & Weekends (Mon-Fri 10pm-6am, Sat & Sun)
Base unit price	6.26 €cent / kWh	3.13 €cent / kWh
OTHER CHARGES PER UNIT (KWH)		
Network charge	7.14 €cent / kWh	3.57 €cent / kWh
National levy (the Green Energy Fund)	0.40 €cent / kWh	0.40 €cent / kWh
TOTAL UNIT COST without VAT	13.80 €cent / kWh	7.10 €cent / kWh
+ VAT at 20%	2.76 €cent / kWh	1.42 €cent / kWh
Total unit cost incl. VAT	**16.56 €cent / kWh**	**8.52 €cent / kWh**

Annual charges and discounts (to be included in your annual statement)
Flat annual fee: € 50 per year (+ VAT at 20%)
Your discounts: minus € 15 per year for direct-debit payment

An example for a good costumer invoice layout can be found here.
This invoice does not use calculated network amounts – it shows the prices per kWh.

Correction Process on Distributor Side



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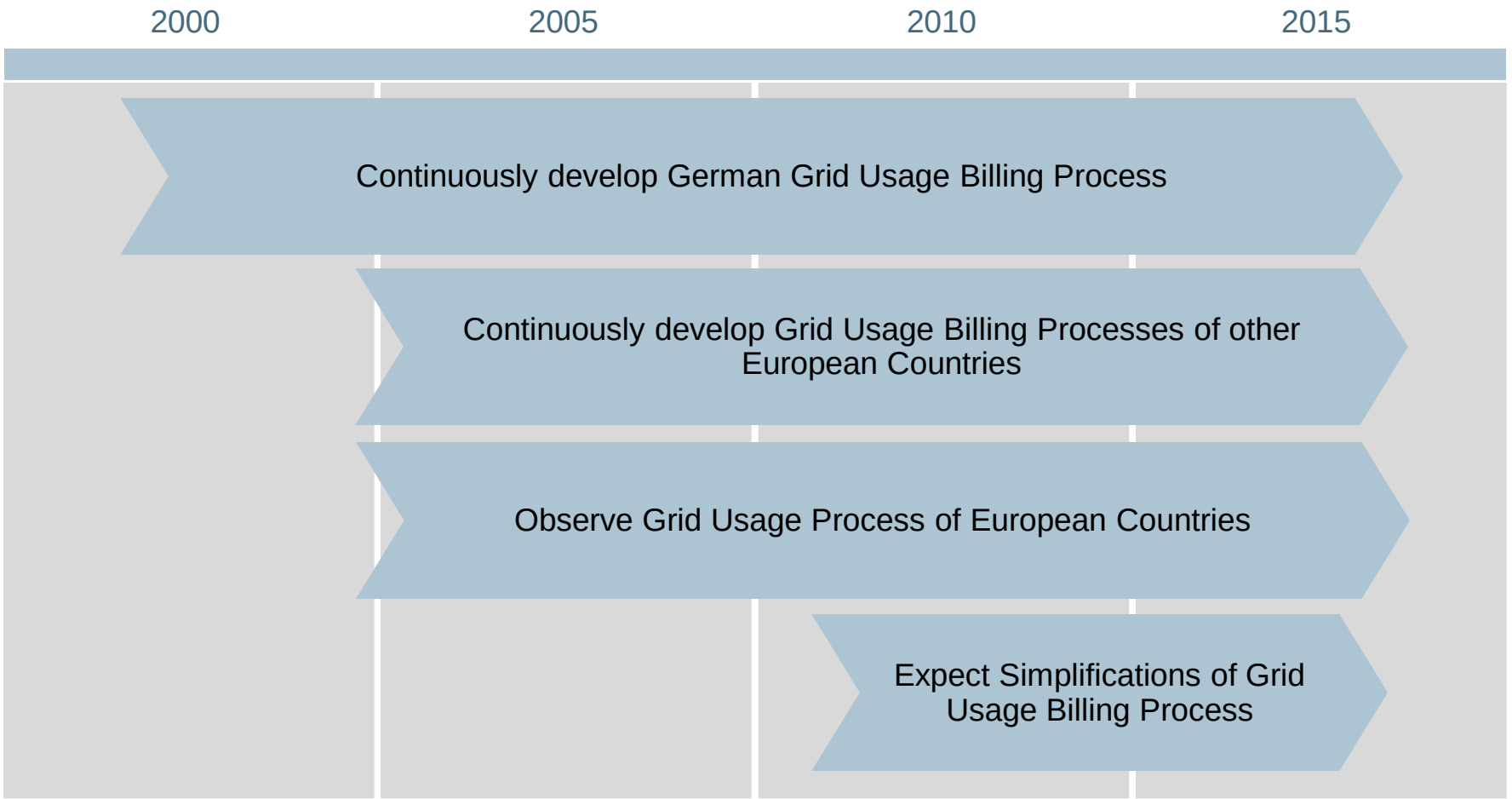
Outlined Activities: Grid Usage Billing Process



Analyzed countries

	Invoice on PoD level	Invoice on Retail level	Invoice attachments	Data Volume	Calculation basis	Prepayments/ Budget Bills	Process Complexity
Austria	X			High	Consumption		Medium
Belgium		X	X	High	Consumption	Yes	High
Croatia	Not yet defined	Not yet defined	Not yet defined	Not yet defined	Not yet defined	Not yet defined	Not yet defined
Czech Republic	X	?	?	?	?	?	?
France		X	X	High	Consumption		High
Germany	X		X	Very High	Consumption	Yes	Very High
Great Britain		X		Medium	Aggregated consumption	No	Low
Ireland		X	X	High	Consumption		High
Italy		X	X	High	Consumption	No	High
Netherlands		X	(X)	Low	Connection capacity	No	Low
Portugal		X	X	High	Consumption		High
Slovakia		X	?	?	Consumption	Yes	?
Spain	X	?	?	?	?	?	?
Sweden	X			High	Consumption		Medium
Switzerland	Not yet defined	Not yet defined	Not yet defined	Not yet defined	Not yet defined	Not yet defined	Not yet defined

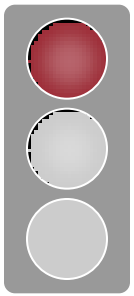
Country Sheet: Germany

Grid Usage Billing Process:

- Single Grid usage bills are created and communicated on PoD level and consumer account
- Aggregated grid usage bills are created on retailer account
- Incoming payments are firstly assigned to retailer account and then distributed to consumer accounts
- Budget billing procedures are used
- Complaint processing on PoD level

Evaluation:

- High data volume at the edge of technical possibilities
- Complex reconciliation processes between consumer and retailer accounts
- Complaint processing on PoD level and therefore complaints on “low amount” bills



High operational costs due to complex processes and high data volume

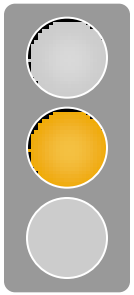
Country Sheet: Great Britain

Grid Usage Billing Process:

- Aggregated consumption time series are sent from an independent market party to the distributor and the retailer on a daily basis
- Grid usage bill is created monthly on retailer level
- Grid usage bill refers to aggregated consumption
- Grid usage bill is sent in paper format

Evaluation:

- Medium data volume due to handling of aggregated measurement values
- Bilateral complaint processes on the same data basis (aggregated consumption data)
- Corrections are always included as overall amounts within the follow-up bill



Medium operational costs due to robust processes and medium data volume

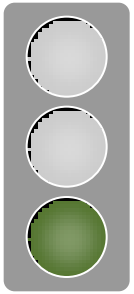
Country Sheet: Netherlands

Grid Usage Billing Process:

- Grid usage bill is created monthly on retailer level
- Grid usage bill refers to number of metering points and respective connection capacity (fixed prices per connection capacity class)
- Grid usage bill is sent in paper format

Evaluation:

- Low data volume
- Bilateral complaint processes on the same data basis (number of PoDs within a connection capacity class)



Low operational costs due to robust processes and low data volume

Thank you