

REGIONAL METERING SYSTEM FOR CROSS-BORDER POWER FLOWS

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Problem: inadvertent power flows in CAPS

Unplanned power exchanges due to:

- Deviations in regular electricity flows via CAPS power ring
- Secondary load frequency control
- Unplanned power deficit in national power systems: mutual assistance in case of emergency
- Seasonality of hydropower in the region
- Other

Status quo: metering and settlements

- For operational needs, telemetry data are used
- Power exchange through low voltage lines is not controlled by telemetry;
- Official settlement period is 1 month;
- CDC reports daily and by 10-day periods based on operational data;
- By the end of the settlement period, the difference between operational data (integrated telemetry data plus supplies at low voltage) and readings from commercial meters is significant;

Status quo: methodologies (1)

Existing methodologies:

- Methodology for determination of frequency (load) control service volumes for UPS of Central Asia and Integrated Power System of Kazakhstan (June 1, 2007)
- Methodology for calculation of volumes electricity transit services in CAPS and South Kazakhstan Power System (last amendments of October 26, 2007)
- **Methodology of balancing of net electricity flows within CAPS and South Kazakhstan Power System (of June 20, 2009)**

Status quo: methodologies (2)

Balancing methodology

- Non-monetary settlements:

At the end of each month all the commercial metering data is reported to CDC Energy. The unplanned power flows should be returned back during the next month with a volume that equals actual consumption. In month C+2 the amount of energy to be return is 20% more than the actual consumed during the current month. In month C+3, this energy volume increases to 1.5 times the original amount.

- Monetary settlements:

used if the above procedure fails to reach zero balance.

Status quo: practical issues

Inadequate metering renders the methodologies inefficient

Metering based on telemetry data integration makes it practically impossible to bring the net power exchanges to zero by the end of the settlement period (month)

This calls for monetary settlements, which requires appropriate power purchase agreements and timely cash payment

Solution: Regional AMR System

A Regional Automated Meter Reading (AMR) system would:

- make it possible to use hourly (half hourly) commercial data for operational needs
- increase accuracy of interim planning and create conditions for timely correcting measures

It would also:

- establish communicating protocol for metering data exchange within CAPS
- assist in harmonization of metering procedures and coordination of metering equipment and systems used for commercial metering

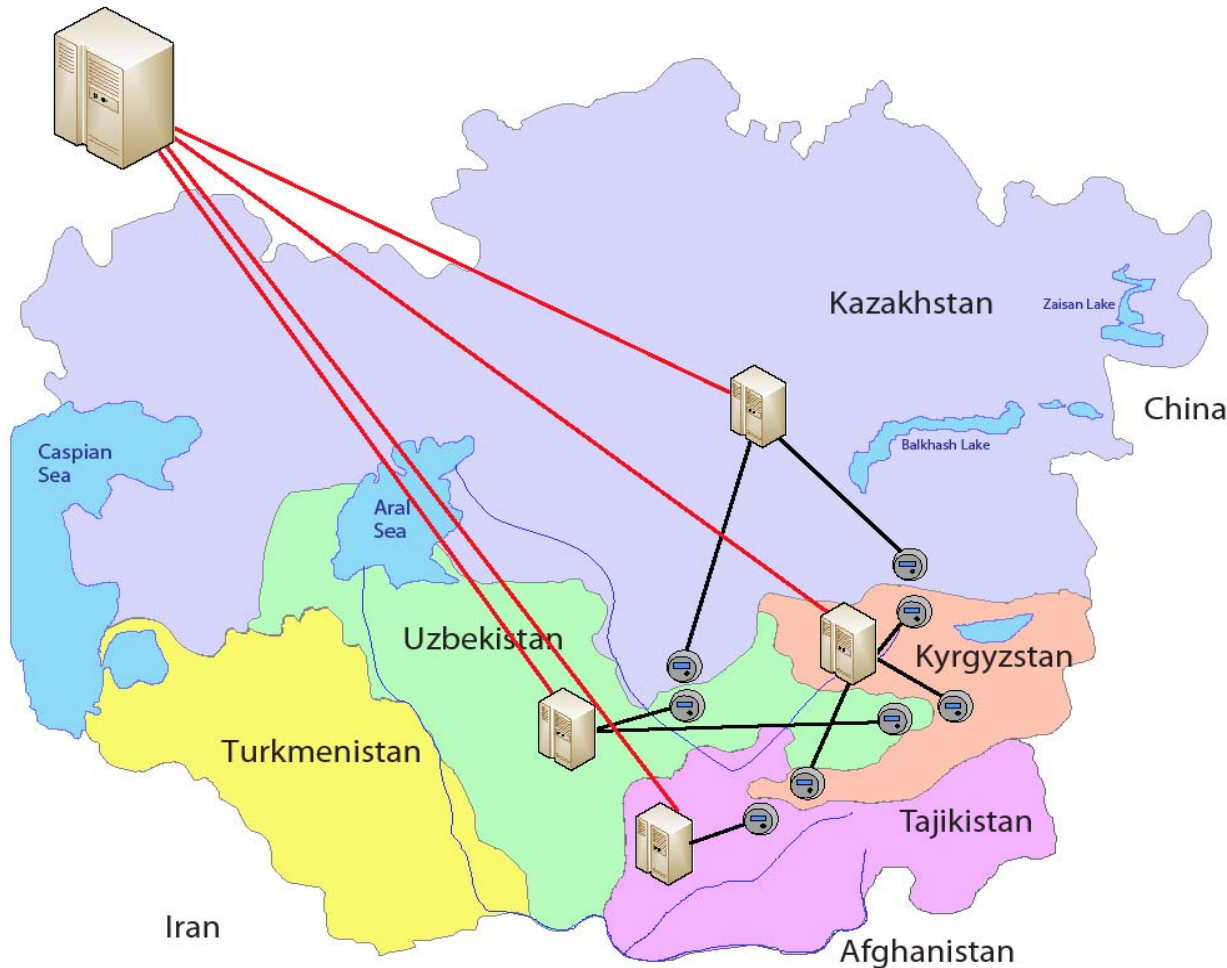
Regional AMR System: principles (1)

- It is not a separate centralized metering system. Eventually, it would become an “upper level” structure over fully functioning national wholesale metering systems
- The system includes all commercial metering points on CAPS borders
- If the metering points are equipped with modern meters that can be read remotely, these meters would be integrated in the new system
- Where modern meters do not exist, or can't be integrated into new system, new ones would be installed

Regional AMR System: principles (2)

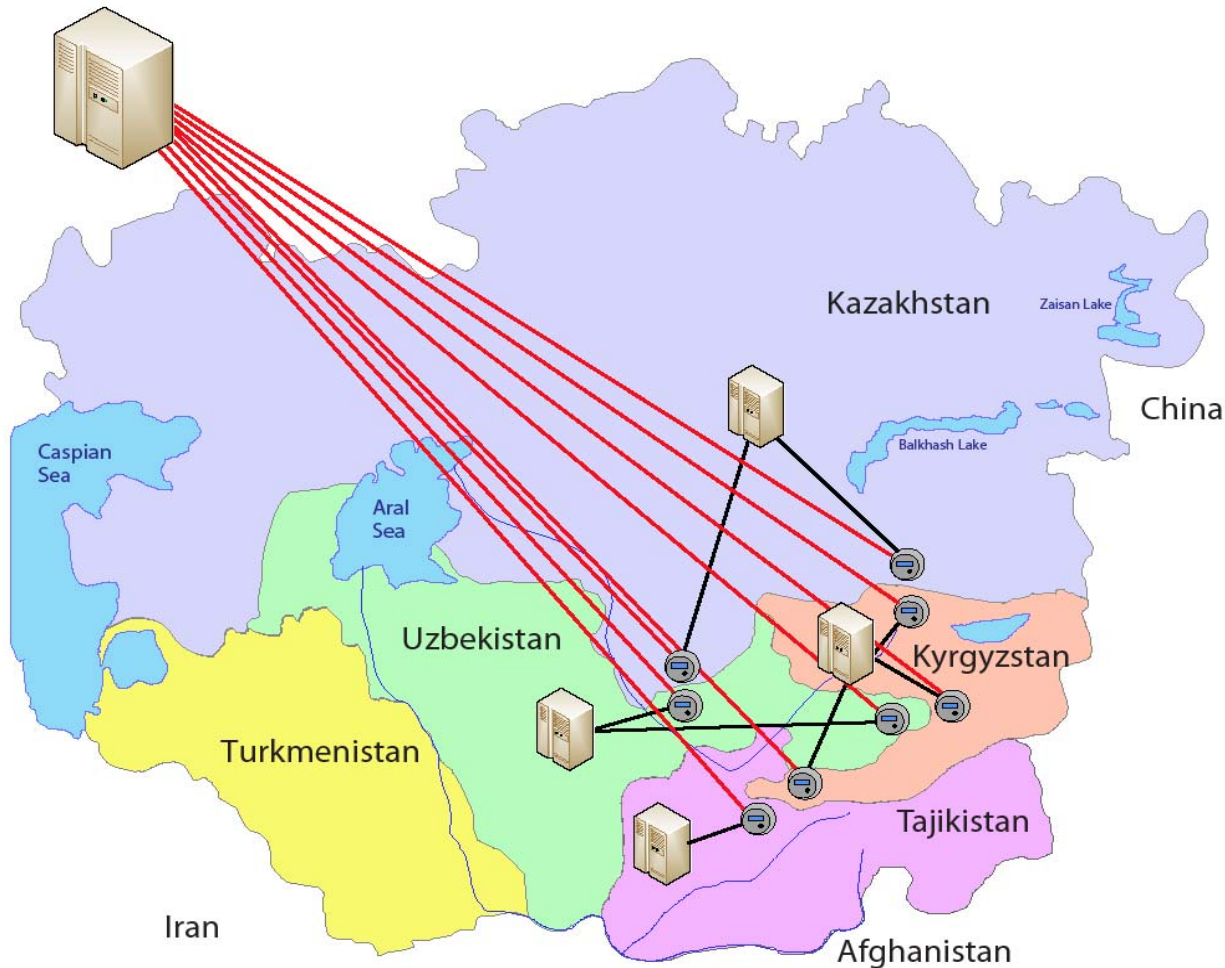
- Four data source segments - national metering system operators, plus CDC as metering data aggregator
- CDC to have an operational unconstrained access to all cross-border meters
- Each national operator has unconstrained access to all meters installed on its border (on either side)
- Other metering data access issues need to be resolved on a bilateral basis
- Each national “upper level” metering database can be interlinked to the main national AMR system
- Implementation strategy must be developed and coordinated with all national companies

Regional AMR System: options (1)



Access to
meters via
national
metering
databases

Regional AMR System: options (2)



Direct
access to
meters from
CDC

Regional AMR System: implementation strategy

- Development of the concept
- Inventory of the existing metering equipment and procedures
- Coordination with national remetering strategies plans or existing metering procedures
- Development of a detailed design
- Obtaining approval from each CAPS member
 - Necessary steps to reach consensus: meetings, seminars, etc.
- Selection of equipment suppliers and installers
- Purchase, installation, system integration
- Pilot operation
- Certification
- Commercial operation

Regional AMR System: possible issues

- Meters on 0.4 kV and 10 kV lines
- Installation works: outsourcing or national transmission operators?
- Communication with remote meters: are they all covered by mobile operators?
- Type of communication channel and mobile communication protocol: land line, GSM data, GPRS, other?
- Certification: national, regional?
- ???

Regional AMR System: level of support

Discussed and initial support was expressed by

- CDC Energia
- SJSC “Uzbekenergo”
- OJSC “NES of Kyrgyzstan”

Discussed with no immediate indication of support

- KEGOC, Kazakhstan

Not discussed yet

- OSHC “Barki Tojik”, Tajikistan (pending permission to begin working on RESET in the country)



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THANK YOU

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