

Air quality at school

Pilot project at SSPŠ Prague



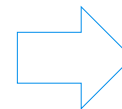
IQRF Alliance Meeting 2017

Petr Hájek, B&PD O2ITS

Background



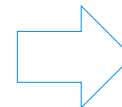
- EU Law acts, directives, decisions
- EC Recommendation – research project SINPHONIE (Schools Indoor Pollution and Health: Observatory Network in Europe)
- WHO Statement issued by WHO in March 2014 – Indoor air quality guidelines



EU legislation exists



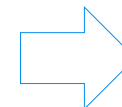
- Czech legislation is based on EU legal documents, EC Directives and sets basic requirements for the characteristics of buildings that must be followed.
- Czech legislation considers the CO2 concentration of 1,500 ppm in the rooms for the maximum allowable. (20/2012 § 11)



Czech legislation exists



- Státní zdravotní ústav – Quality of indoor environment in kindergardens 2015-16
- SZÚ - Quality of indoor environment in schools 2012
- Pilot measurements – ZS Polná
- (In observed period of five teaching hours (7:50 to 12:30) pupils spent in good quality air (less than 1000 ppm CO2) just 17 minutes. Decreased air quality (1 000 - 1 500 ppm CO2) lasted 1 hour 58 minutes.)



National studies on health effects of IAQ exist



- Law acts and recommendations include the requirement for good indoor climate and does not specify any actions to guarantee this goal.
- Schools owners/founders are responsible for building related tasks
- More research is required and, similarly more studies should be performed

ŠKOLA
PODPORUJÍCÍ ZDRAVÍ

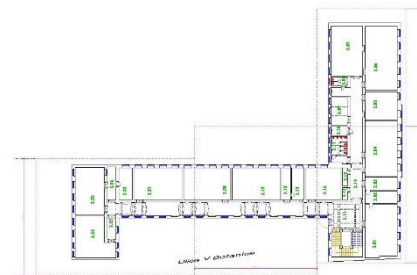
School pilot project

Typical school

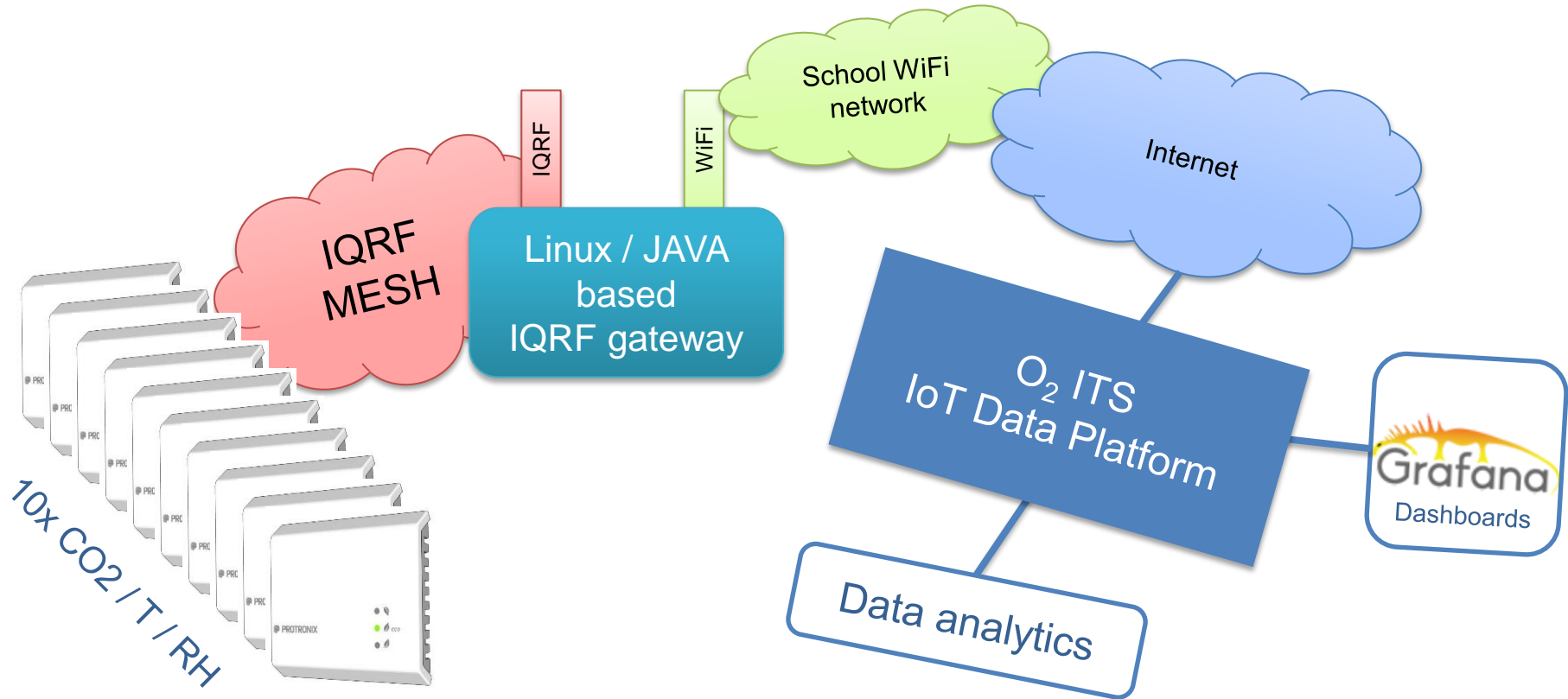
- Schools very often focus on EU funds for improvement of building effectiveness and energy savings.
- EU funds co-financed renovation of 4500 schools in CR
- Protection against penetrating cold through the wall - insulation
- Window frames made of plastic
- Budget limits - building maintenance and repairs are under-budgeted.
- The building is newly renovated and has no ventilation.
- Schools frequently have a large number of heating, ventilating, and air-conditioning equipment (As schools add space, the operation and maintenance of each addition are often different)
- Schools sometimes use rooms, portable classrooms, or buildings that were not originally designed to the unique requirements of schools
- Some class rooms are fully carpeted

SSPS project

- 10 indoor air quality sensors
- 2 outdoor air quality sensors
- 2 gateways (wifi)
- Continuous measurement x special measurements (filling form according activities realized in the classroom - ventilation, number of students)
- Duration 5 months

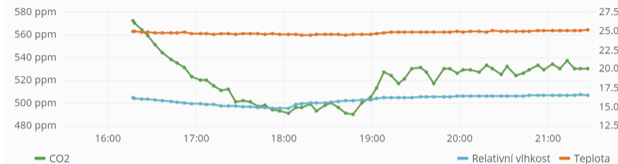


Technical solution

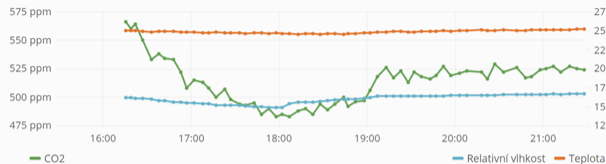




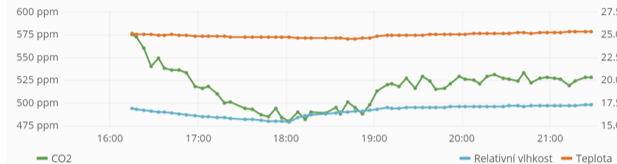
Senzor 01



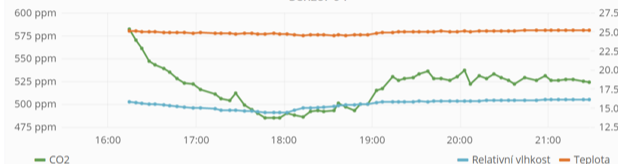
Senzor 02



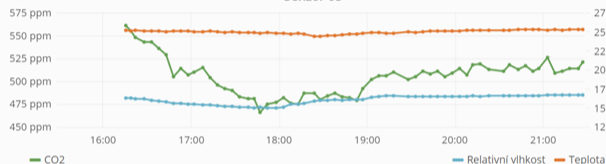
Senzor 03



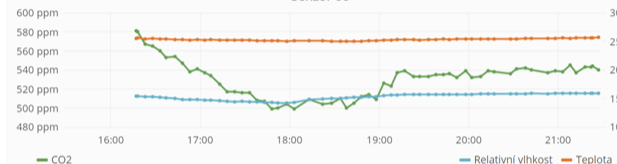
Senzor 04



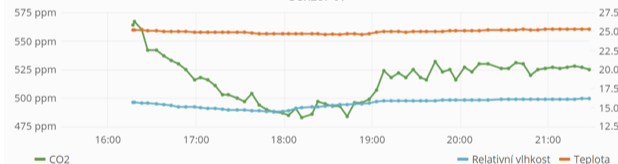
Senzor 05



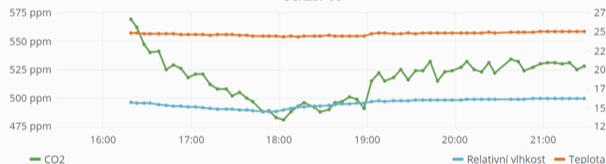
Senzor 06



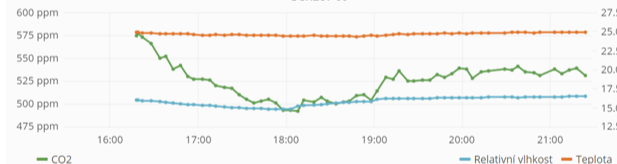
Senzor 07



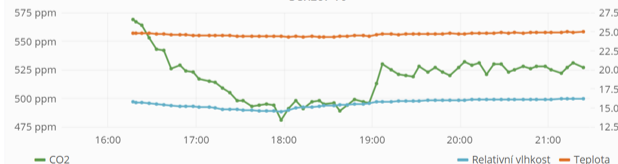
Senzor 08



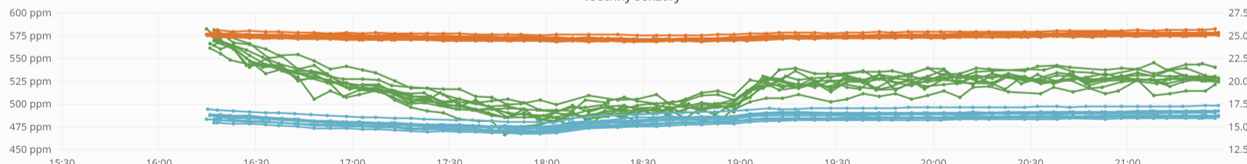
Senzor 09



Senzor 10



Všechny senzory





Alerts

Relativní vlhkost
♥ ALERTING for před 3 hodinami

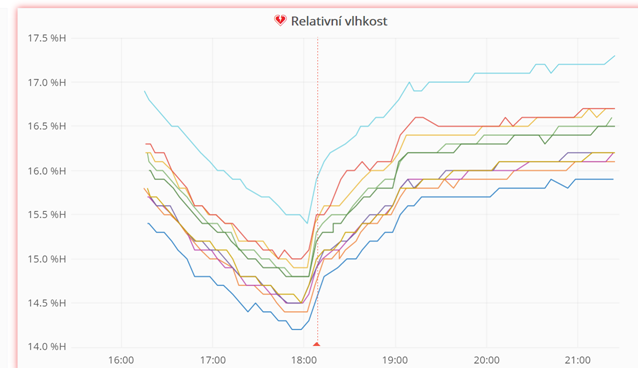
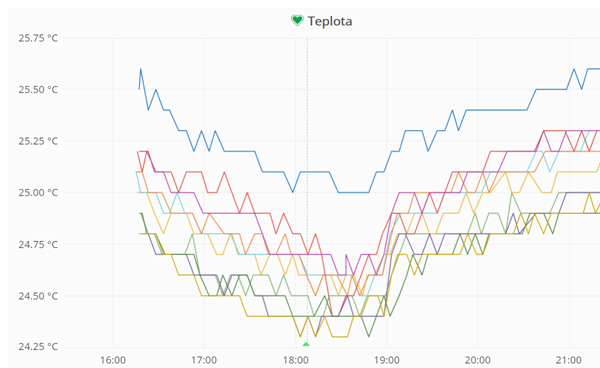
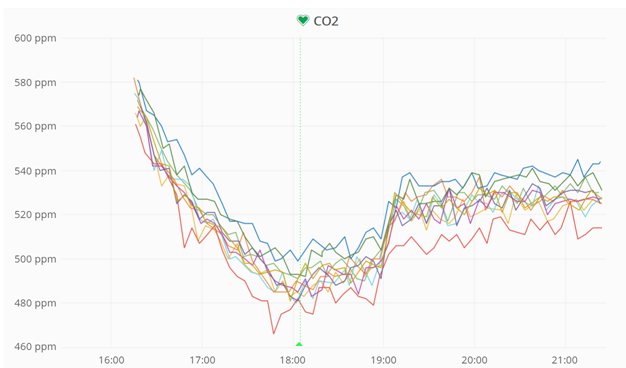
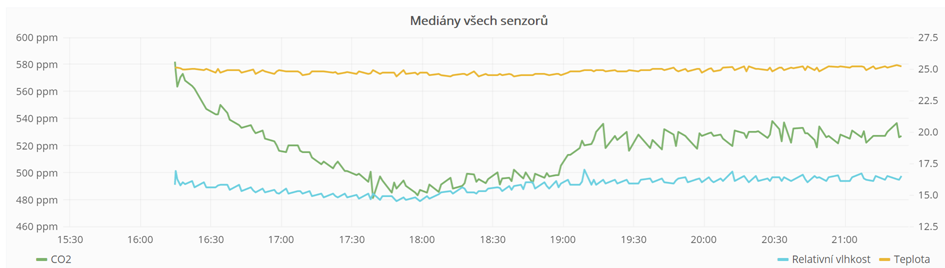
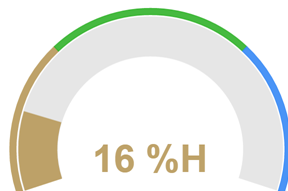
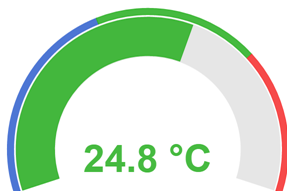
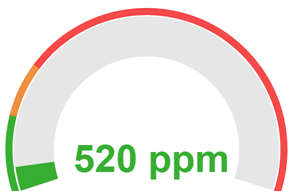
2017-01-05

21:27:13

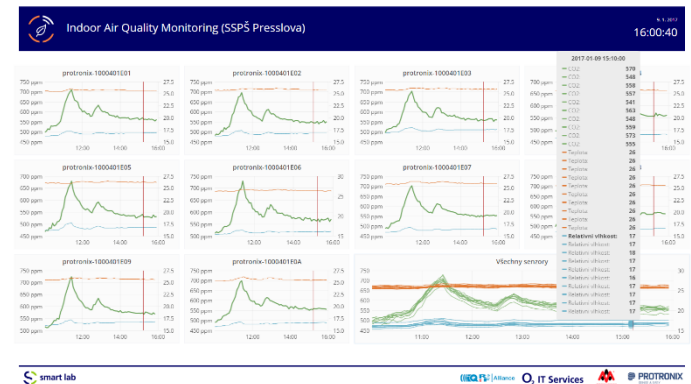
CO₂

Teplota

Relativní vlhkost



Potential impacts



SSPS project

- Permanently collect relevant data for long period
- Open discussion with school founders/local administration
- Promote air quality in school as competitive advantage
- Name general recommendations
- Provide relevant data for EU funds subsidy procedure
- Verify project results with other schools – business potential
- Get a type/partner solution catalog IQRF Alliance / Smart solutions

Local administration / founder

- Permanently collect relevant data for future decisions - provide evidence
- Combine with outdoor air pollution policy
- Detect areas that need improvement in the school's occupational safety and health and environmental health programs
- Promote air quality in school as public health benefit
- Let founders to define IAQ policies and guidelines
- Set administrative versus technical measures
- Distribute information to public – non controversial theme