

water and energy

water usage in energy producing technologies

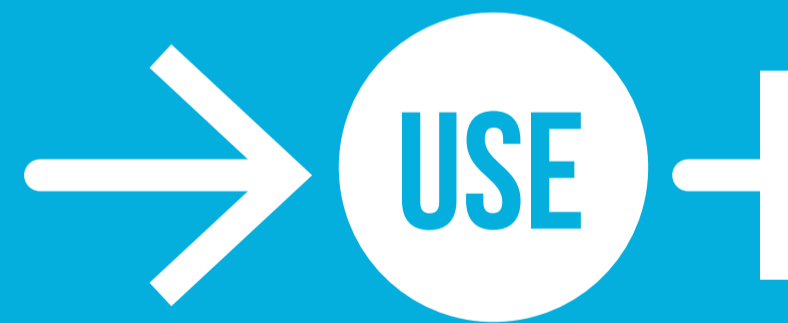
before starting

what is water use

WATER WITHDRAWAL



WATER CONSUMPTION

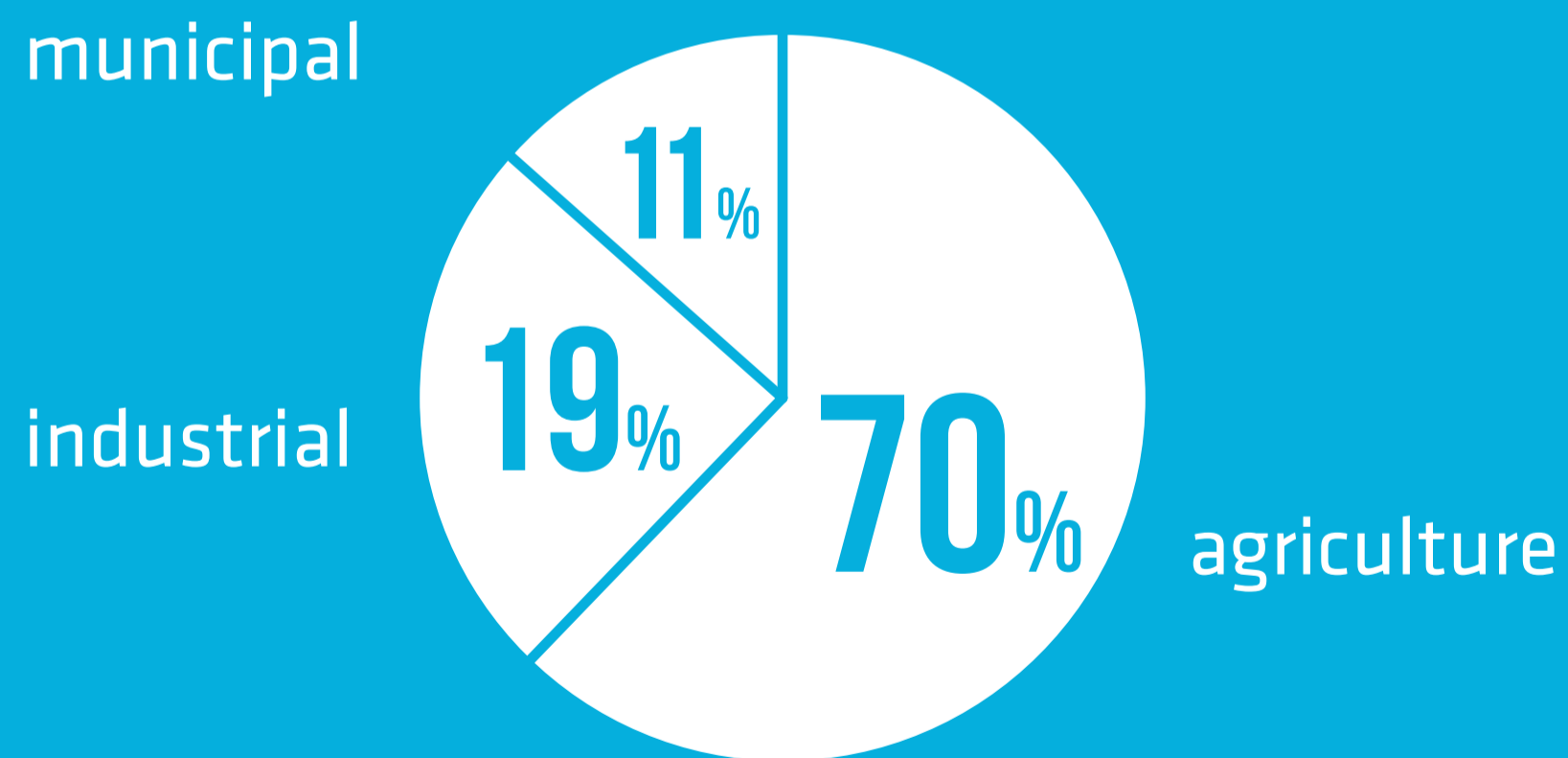


diverted (off-stream water use)
can be combined with consumption
quality is altered most of the times

context

global sums of all withdrawals

40.000 KM3 - FRESH WATER AVAILABLE



WATER WITHDRAWAL

energy

technologies that use freshwater *

THERMOELECTRIC



HYDROELECTRIC

dams
run-of-the-river
micro-hydro

PERCENTAGE OF WORLD TOTAL

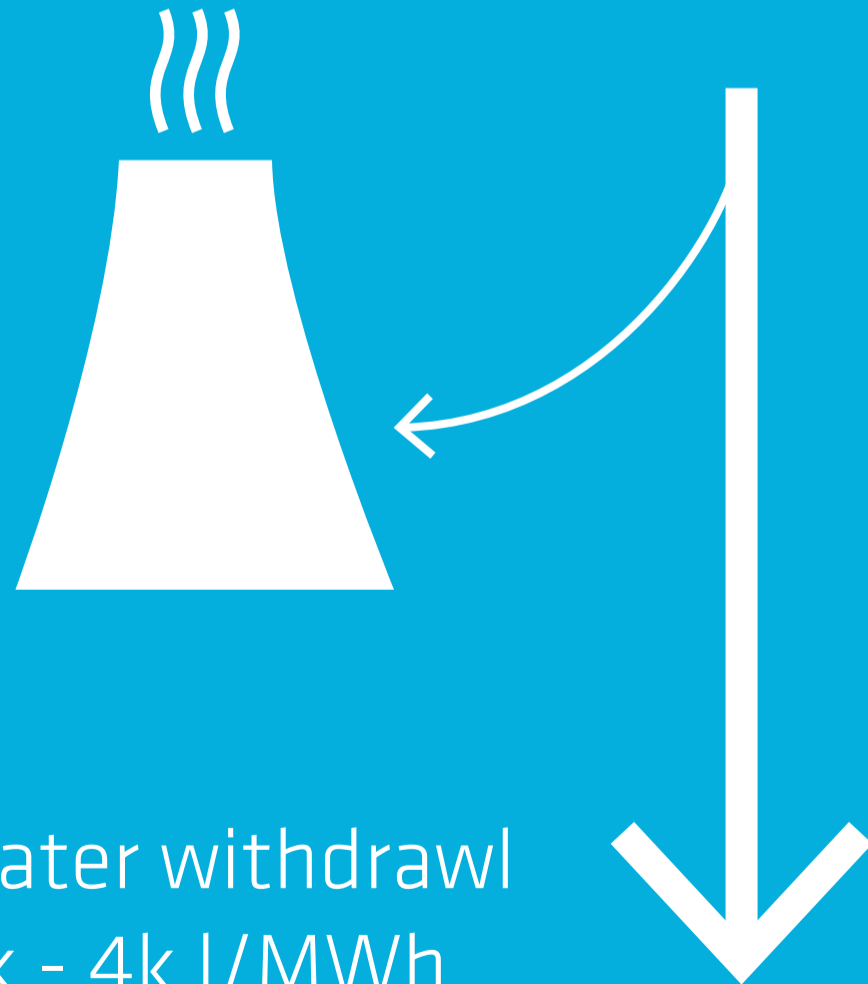
coal - 41%
oil - 5%
natural gas - 21%

renewables - 16%
other - 3%

thermoelectric

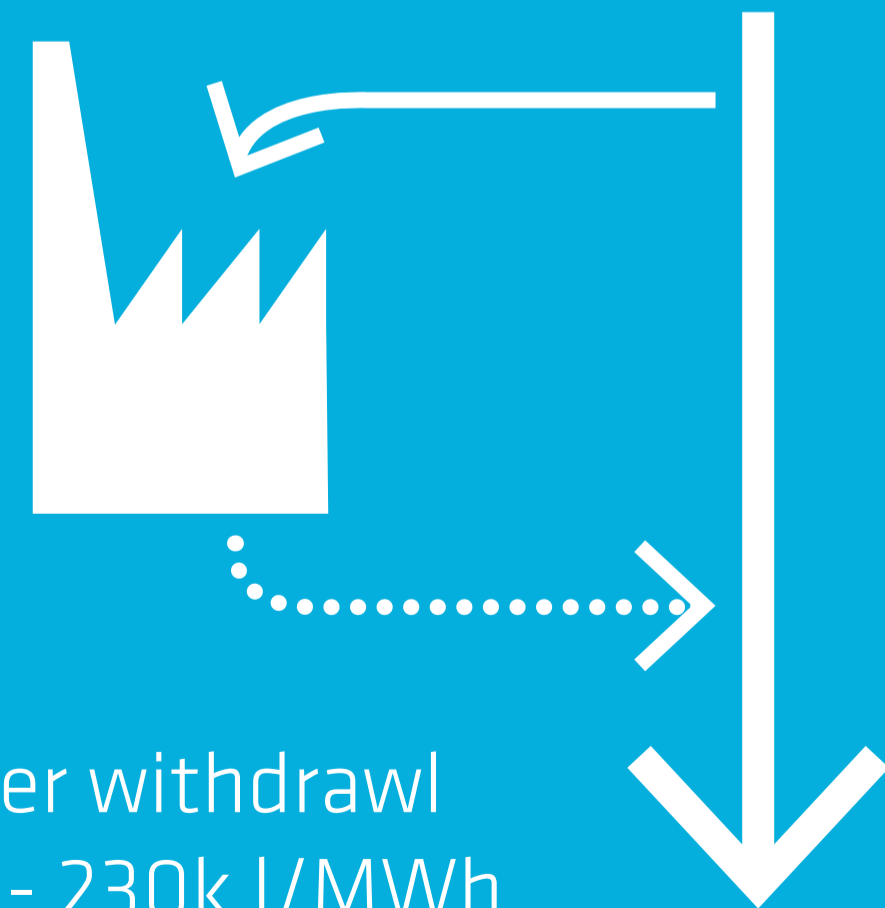
principles

RECIRCULATING COOLING



water withdrawal
2k - 4k l/MWh

ONCE-THROUGH COOLING

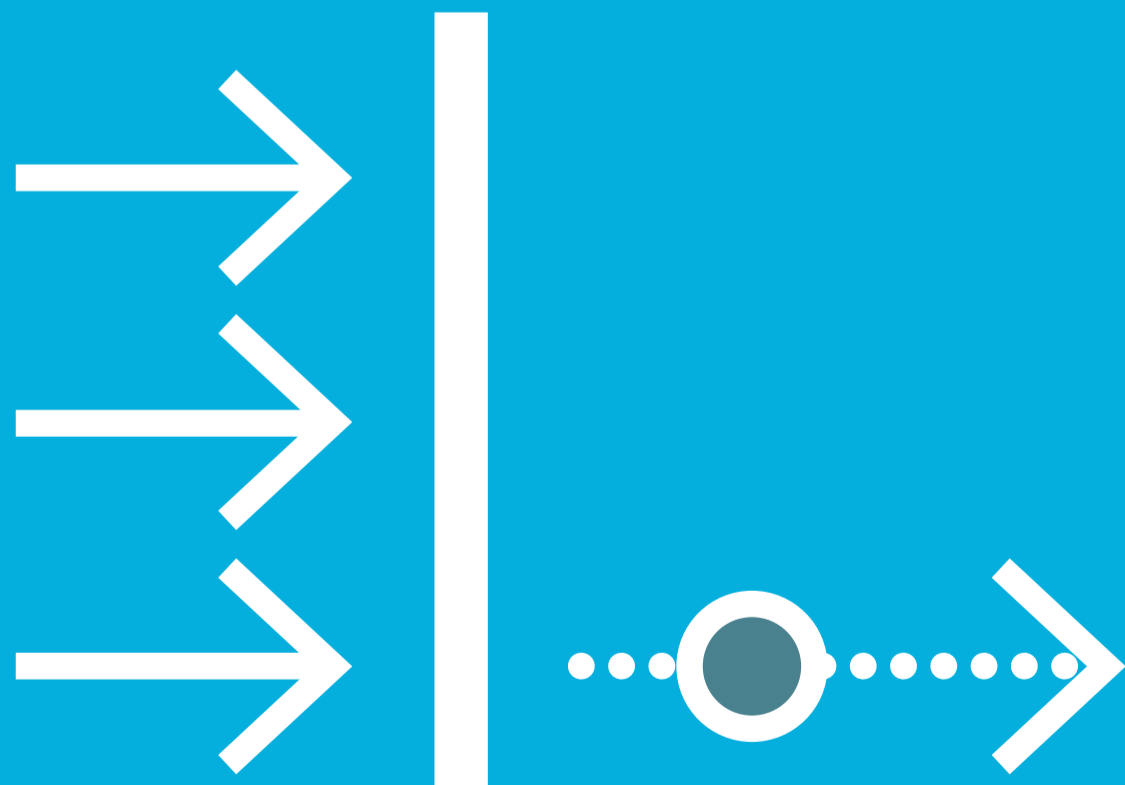


water withdrawal
76k - 230k l/MWh

hydroelectric

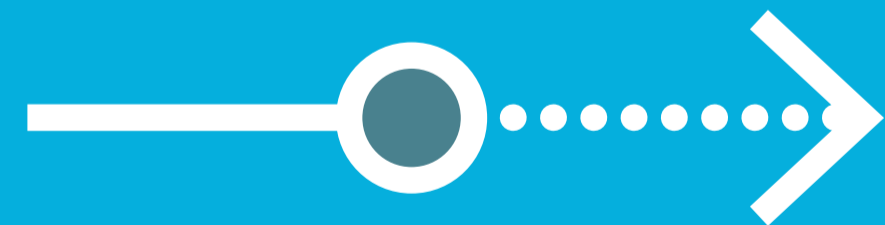
seen as renewable energy, but has great environmental impact

DAM



WATER CONSUMPTION
THROUGH EVAPORATION

RUN-OF-THE-RIVER



NO WATER CONSUMPTION

hidden water use

water employed in the fuel production

coal

most used fuel for producing electricity

SUMMARY OF WATER RELATED ISSUES AT DIFFERENT MINING STAGES:

Exploration/site preparation
Mineral extraction
Processing (washing)
Product transport
Mine closure/post operation

OPEN-CAST MINING IS RESPONSIBLE FOR COMPLETE ENVIRONMENTAL DESTRUCTION

fracking

“fun” facts on extracting shale gas

ENVIRONMENTAL RISKS RELATED WITH WATER

contaminating ground water
depleting fresh water

4-30 milion liters to complete each fracturing job (4k-30k m³, 30-230 tank car)
150k litres of chemicals mixed with withdrawled water (1 tank car)

romania

ENERGY PRODUCTION

in 2008 the electricity production was 64,7%
of wich 43% coal, 26% hydro, 17% nuclear

in 2013 it had 41% renewable energy production

According to a GreenPeace analysis, Romania should reduce the coal dependency
and grow the production of renewable energy.

renewable energy and water use

transition to renewable energy

SOLAR POWER

thermal|photovoltaic|concentrated

WIND POWER

HYDROELECTRICAL POWER

TIDAL POWER

GEOHERMAL ENERGY

BIOMASS

RENEWABLE WASTE

11.0 %
SHARE OF THE
EU-28

exercise 1

collective living

5 TEAMS

chose a type of building (private or public)
that has permanent or temporary residents
(e.g.. regular block of flats, community type
flats, faculty, school, city hall)

**imagine methods for using less water while functioning
in the same parameters**

exercise 2

citizen's initiative

5 TEAMS

banning energy producing technologies that use unsustainable quantities of water and start the transition to technologies that use reduced amounts of water

formulate 4 main objectives that answer your goal and can be transformed in a draft bill

references and useful links

<http://www.fao.org/nr/water/aquastat/main/index.stm>

<http://www.worldwater.org/data.html>

<http://www.unesco.org/water/wwap/>

<http://www.unwater.org/>