

Topmotors pilot project: experiences from Zhenjiang, China

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Top10 China

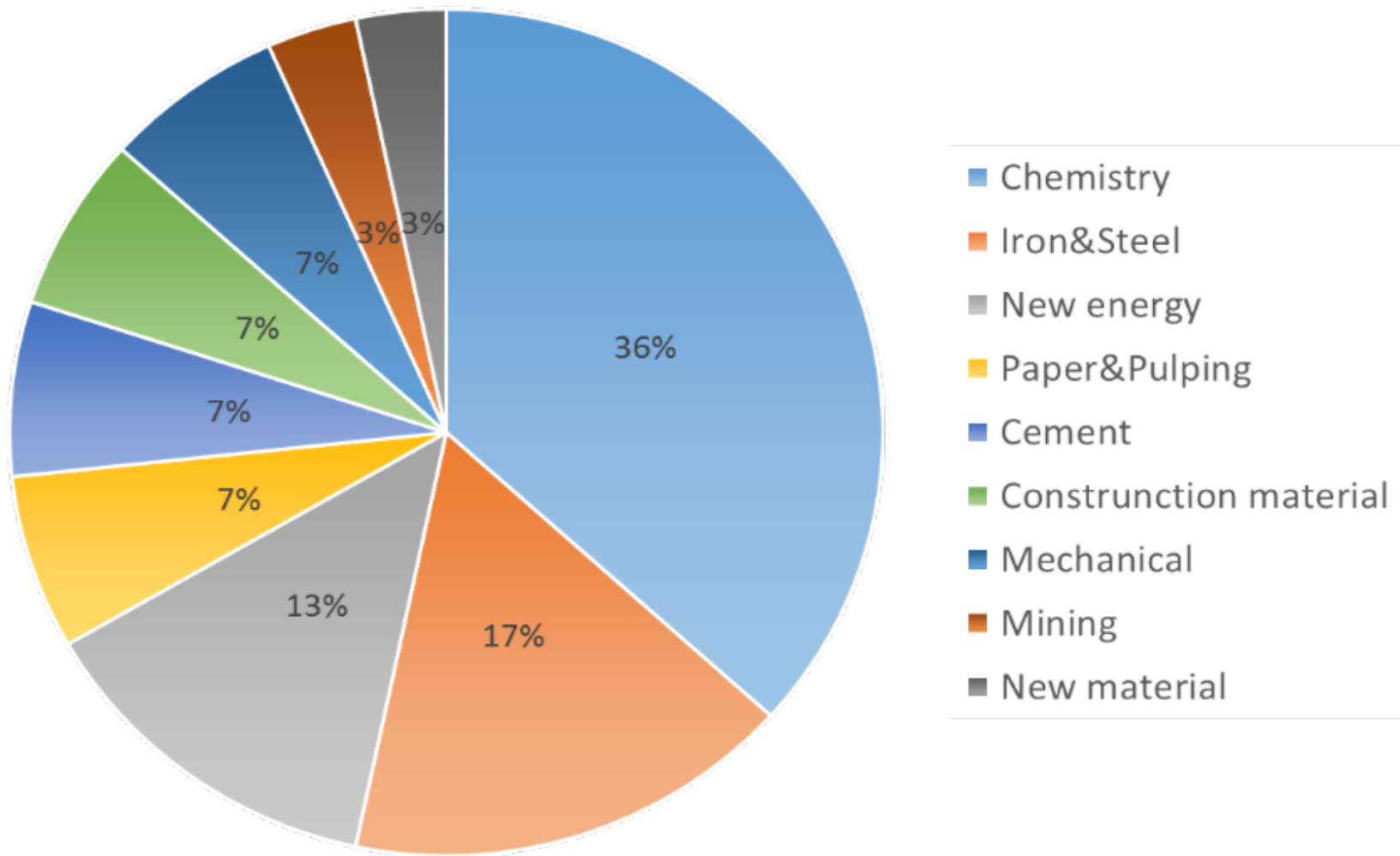
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Motor Summit 2016

Zurich Switzerland

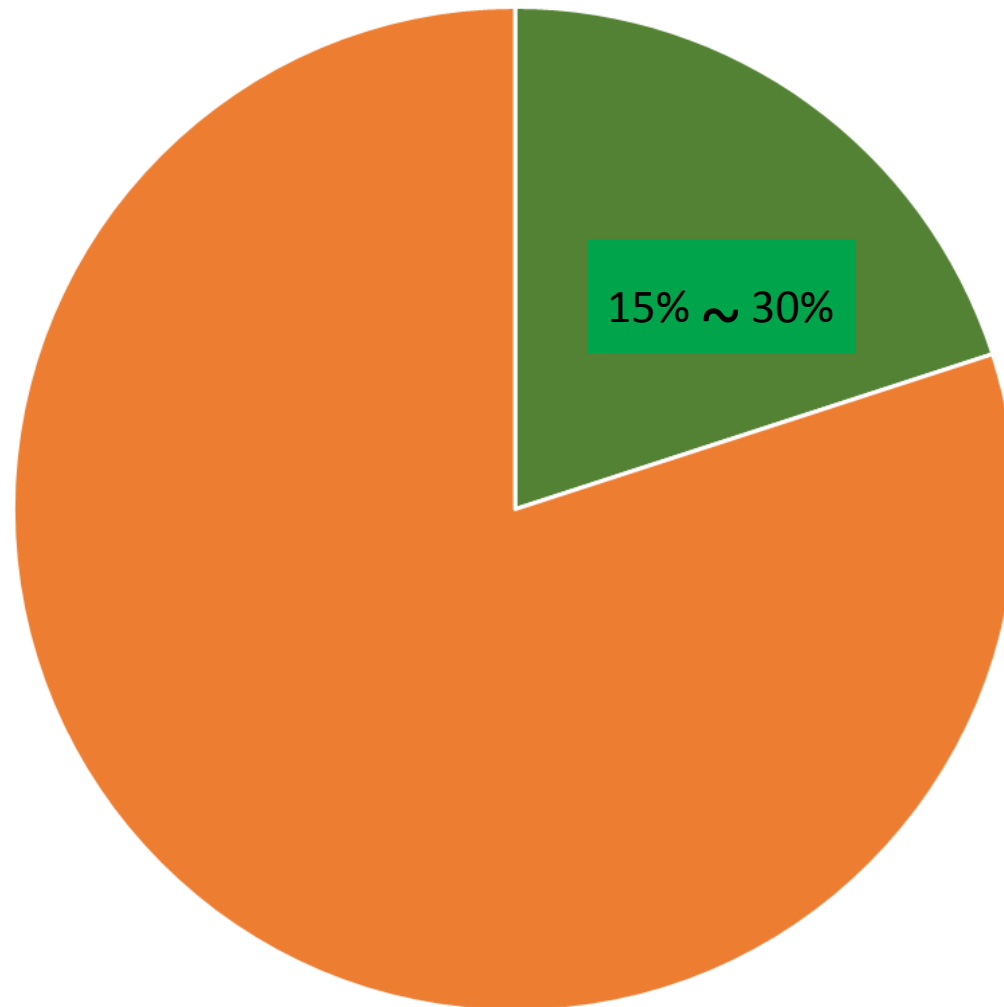
Sino-Swiss Motor System Conservation Pilot Project

- Supported by Zhenjiang Economical and Information Commission and New Area government
- Started from 2014.07
- Imported Swiss EASY program experiences and Motor-Systems-Check Methodology
 - Investigated and assessed 29 factories
 - Motor listing and on-site training for pilot factories
 - Development of energy saving plan for pilot systems
 - More than 70 motor systems have been tested and 20 testing reports produced : total annual electricity savings 14 GWh.

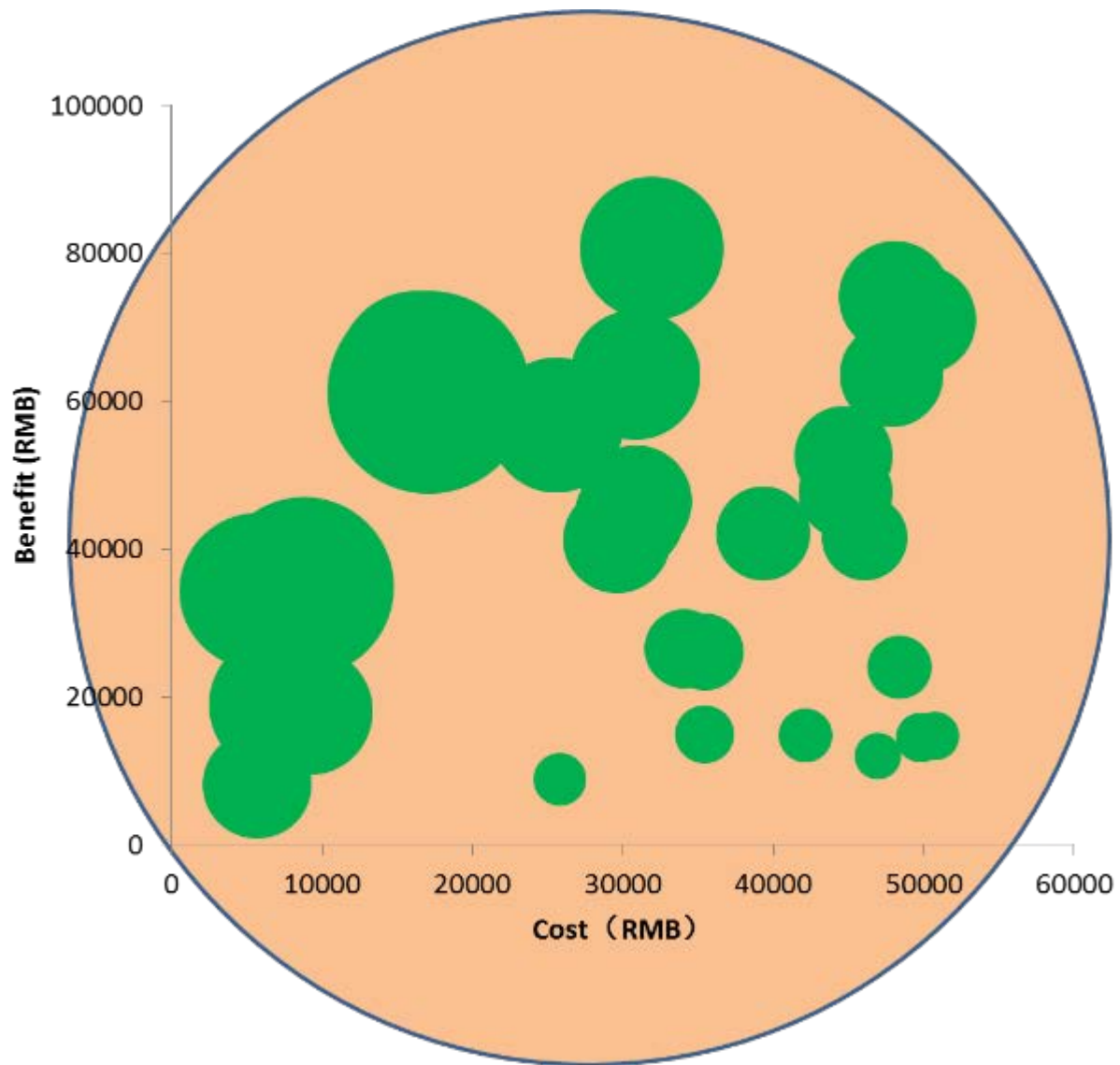


* Numbers of factories

- Wide age range of age of motors: from 1996 to 2011
- Long motor operating hours: $\geq 6'000$ hours per year
- Low factory technology capacity: $\geq 70\%$ factories have no testing capacity
- Low motor system training rate
- Most factories have no full-time energy manager

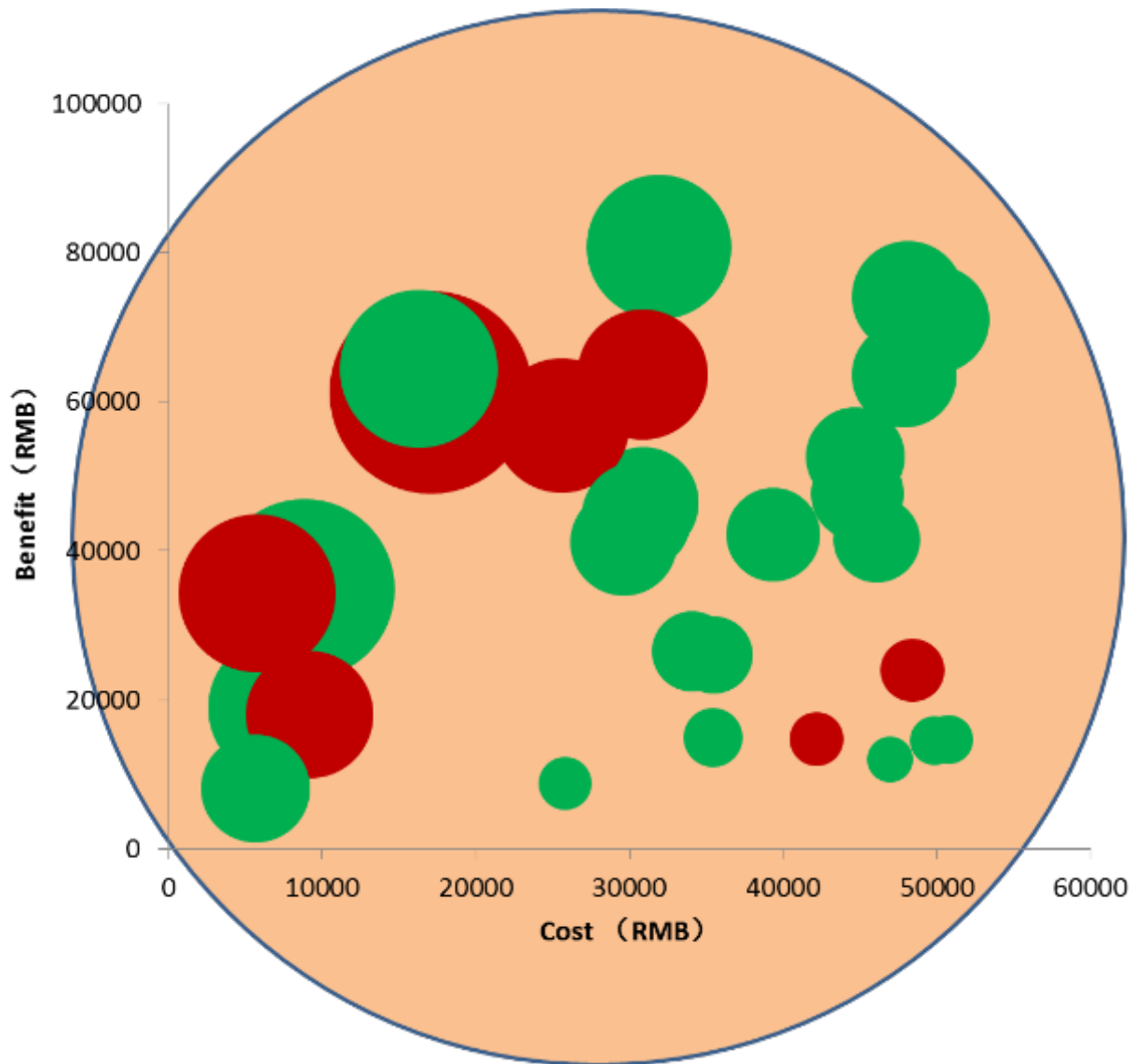




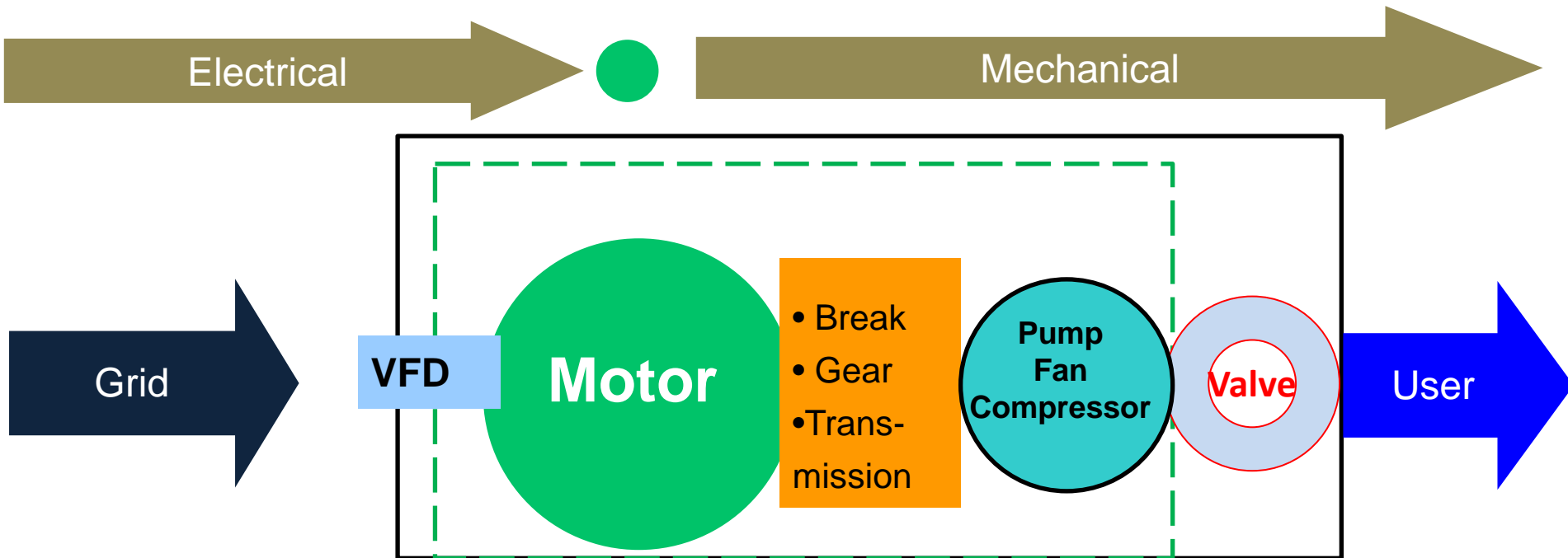




Low hanging fruit



- Load factor of motor is high.
Motor runs in high efficient zone.
- Motor system produces unneeded pressure and flow.
The whole system is oversized.



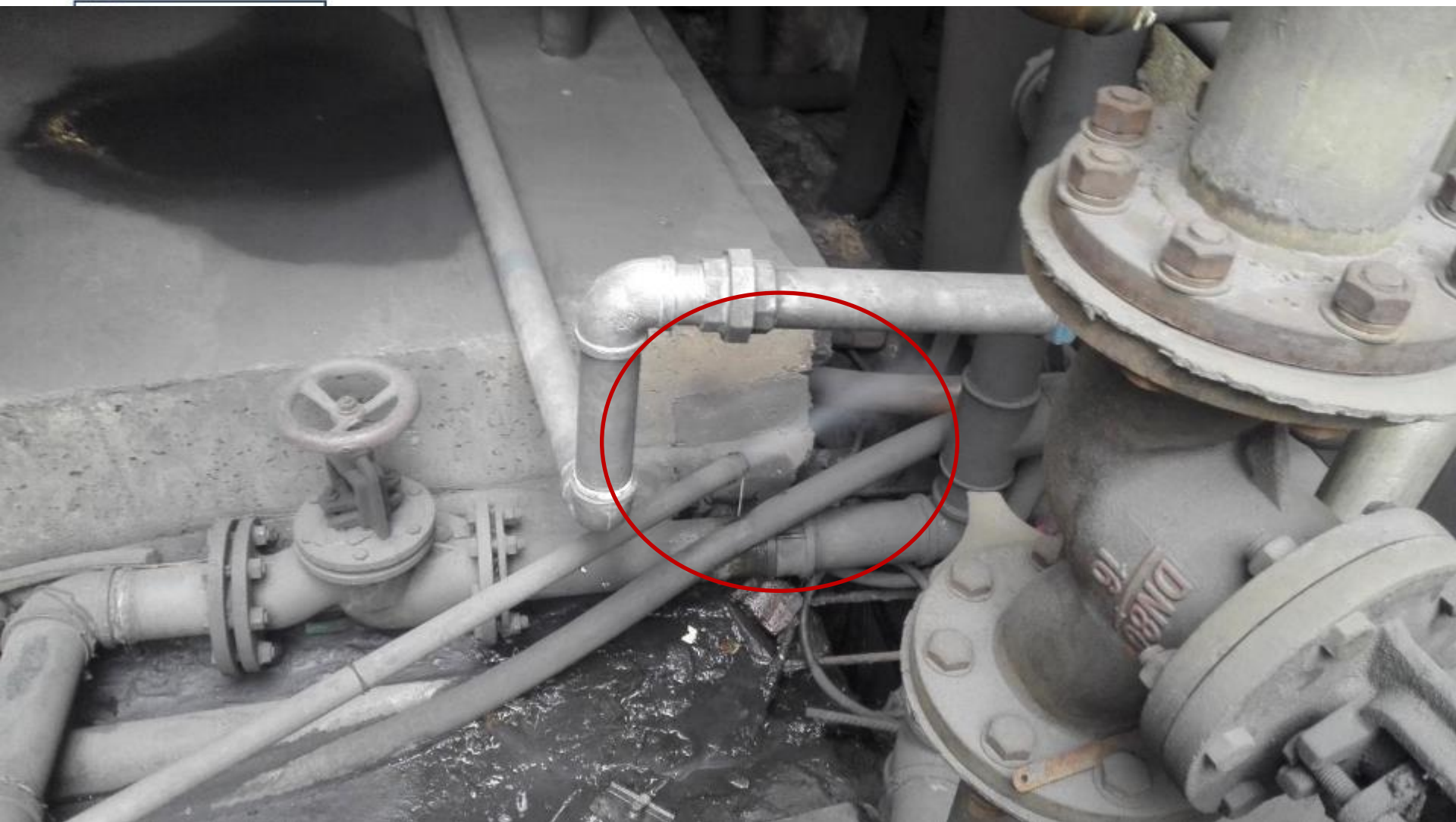
- Pump system is oversized: more flow and pressure than needed
- Pump operating efficiency is decreasing with time: cavitation
- Poor management: all seasons and all the time, same flow and pressure
- Motor load factor is high: simply replacing motor can not save energy

- On-site efficiency testing is difficult: testing for accurate air flow and pressure is difficult. Replacing fan is not popular.
- Dampers are widely applied to adjust flow: mostly in the inlet.
- Most medium and small fan systems have no flow adjustment: efficiency assessment is impossible.
- Low efficient V-belts are widely used.



- Widely used in all factories: low power but long system device chain and high complexity.
- Total system savings potential is high, but several saving points.
- Testing cost is high.
- Significant share of savings come from better system management: better air usage, leakage management, etc.







Users question: any new technology or equipment?

- New technology and device can solve all the problems
- Trust machine more than human being
- Delegate all works to external service companies
- Only pay for “visible” things: equipment, software, etc.
- Sometimes “spoiled”, high expectation of high saving rate ($\geq 10\%$)

- Low willingness to pay directly for consulting services
- Energy service companies have to implement retrofitting project to reclaim earlier stage consulting cost
- Leads to “Excessive medical treatment”

top10.cn Power input testing is acceptable



 **top10.cn** How to drill a testing hole on pipe?



- Subsidy for system efficiency assessment and testing is needed
- Factory staff training should be widely organized
- Managing and technical capacity building by training is very helpful in cutting the early stage cost of analysis
- A mechanism to lower the project risk of factory staff and energy service companies should be developed
- On-site testing methodology should be improved

Thank you!

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