



New Technology for Greater Ventilation, Less Energy Use, and Lower Operating Costs

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Abstract: To drastically reduce operating overhead, look beyond energy use to decrease the entire carbon footprint of your vivarium -- heat, waste, energy, and water. Germain Rivard and Steven Bolewski identify eco-friendly strategies and equipment decisions for building or renovating vivarium space. They document grant research findings on the comparative costs and energy consumption of different caging ventilation solutions and demonstrate the costs and benefits of environmental monitoring and audits. For this project, they implement 1) flexibility of facility use, 2) housing density that allows program growth with less capital spend, 3) operating costs reduction, and 4) green operating practices. They expect to reduce energy use by up to 90% while cutting operating overhead by at least 32%. They also highlight next-generation energy-efficient caging, ventilation, and steam generation technologies that will change the way you think about animal room design, density, and perdiem costs.

1- Seven Eco-Friendly Strategies

2- Background Information to the NYSERDA Grant

- EVC
- Proof-of-Concept
- Energy Audit

3- Energy-Efficient NYSERDA Grant

- Multi-Point Exhaust Ventilation with Low-Pressure Drop Design and Heat Recovery System
- Space-Efficient Caging System
- Room Design: Layout - HVAC, Metrics, perDiem

4- More Eco-Friendly Strategies

- Disposable Caging
- Waste-to-Steam
- Stack-Driven Ventilation

5- Conclusion

- 1- Room Design
- 2- Population Density
- 3- Per Diem
- 4- Carbon Footprint

Dr. Rivard concludes: "The only way to solve the energy challenge is through technologies and innovations. In the rodent housing industry, the right order of things to do to reduce energy use is: first, reduce the demand for plug-ins and air changes; second, recover conditioned exhaust air energy with heat recovery system; and finally, use renewable strategies."

Mr. Bolewski declares: "The most cost-effective initiatives to reduce operating costs are to use exhaust ventilated caging systems to increase density instead of changing ACH rates – that meets both objectives of housing density and energy reduction."



Germain F. Rivard, DVM, PhD
Green Solutions to Productivity, Density, Flexibility, Safety, Valid Data Production

Germain Rivard, DVM, PhD, a project manager at MouseCare, Ithaca, NY which he founded in 2001, has presented on similar topics at Labs 21 and AALAS conferences. Previously, Dr. Rivard was the founder of Animal Care Systems and has several patents related to rodent caging. He published and co-authored relevant articles on 'Engineering Controls' and 'Vivarium Design'. He has whole project responsibility on the NYSERDA grant and other various projects.

Steven M. Bolewski, P.E., *Comprehensive Energy Projects – Team Leader*

Mr. Bolewski has over 25 years of experience in the Energy industry; Energy Management, Construction Management, HVAC Design and Consulting Engineering. He is responsible for all Energy Audits in Upstate New York including securing grant funding, engineering design, analysis, implementation, monitoring, and verification. Projects completed and in process include Central Cooling & Heating Plants, Hospitals, College campuses, Detention Facilities, Industrial Process facilities, Office Buildings, Zoo, Data Centers and Multi-Use sports facilities. Mr. Bolewski is responsible for design/build services.