

boschung

Under the supervision of
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ThawPal

EFFICIENT THAWING, SUSTAINABLE SOLUTIONS

Innovation & Entrepreneurship in Engineering

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Safety, Legal and Property Damages of Ice formation



Safety

AXA Assurance:
Reports > 2000 accidents
claims per day

Legal Constraints

Property owner is
responsible for any
accidents

Property Damages

Ice formation damages
infrastructures

More than 10120 Potential Customers in Switzerland

Hypothesis:

- Every 10 buildings have a parking ramp
- Buildings:
 - Residential building
 >10 dwellings
 - Companies >50 Employees
 - Shopping centers

101200
Buildings 2023

10120
Potential Customers
2023

Current Solutions are Energy Inefficient, Inflexible and Costly

No Spraying solution for the market we are targeting

... liquid de-icing system...



Flexibility

Boschung
FAST



Energy Efficient

Throwing
Salt



Low Costs

Heated
Driveways



Boschung
ThawPal



ThawPal fulfills Facility Managers and Building Owners Needs

Facility Manager

Flexibility of Spraying and using different modes

Building owner

Low power consumption (300 CHF/MWh)

Full monitoring of the device (problems, notifications)

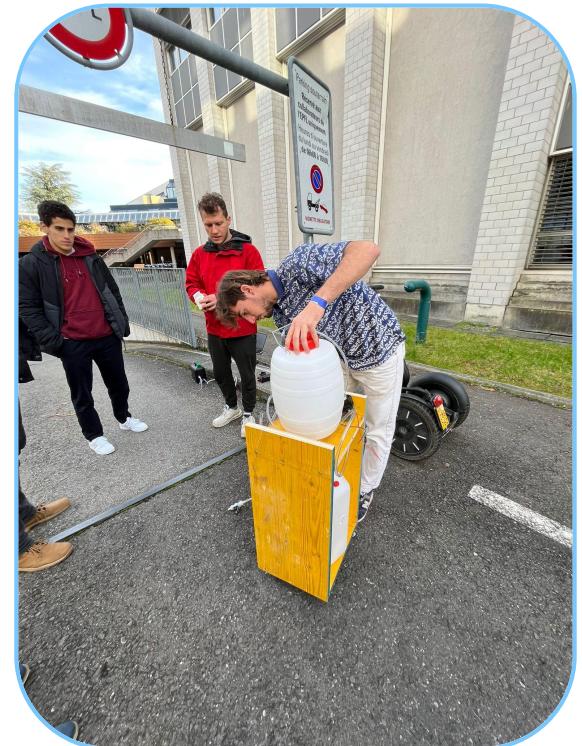
ThawPal

Easy installation, low maintenance cost and time

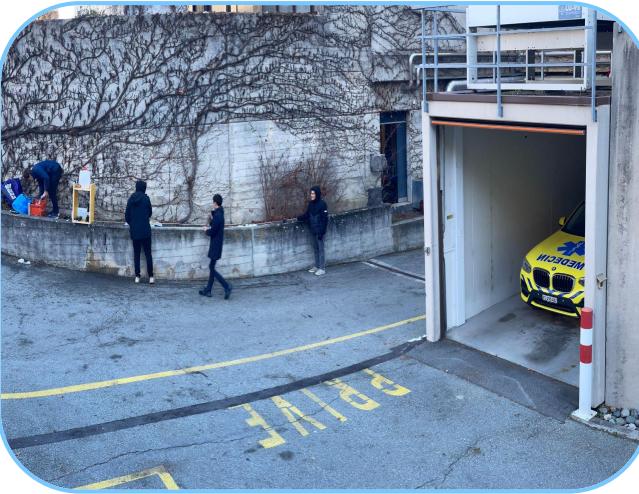
External control via an App or a website

Reliability and security 24/7

EPFL's Prototype Testing Complements our Field Research

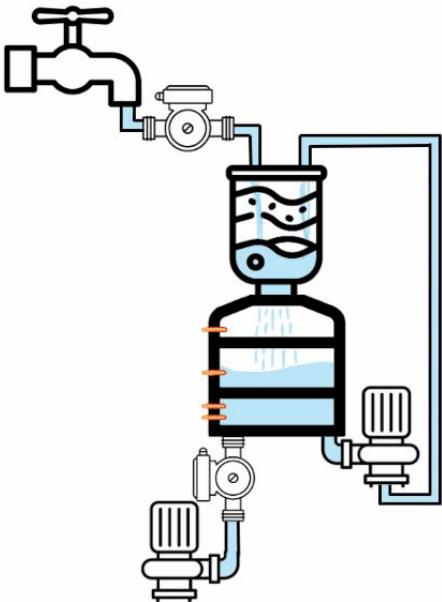


Martigny's Hospital Testing Provides a Proof-Of-Concept

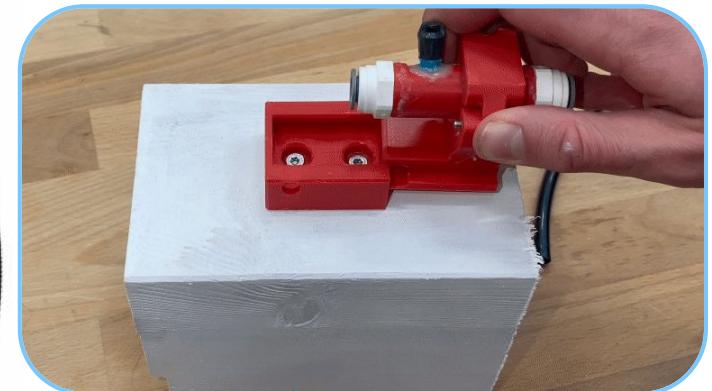
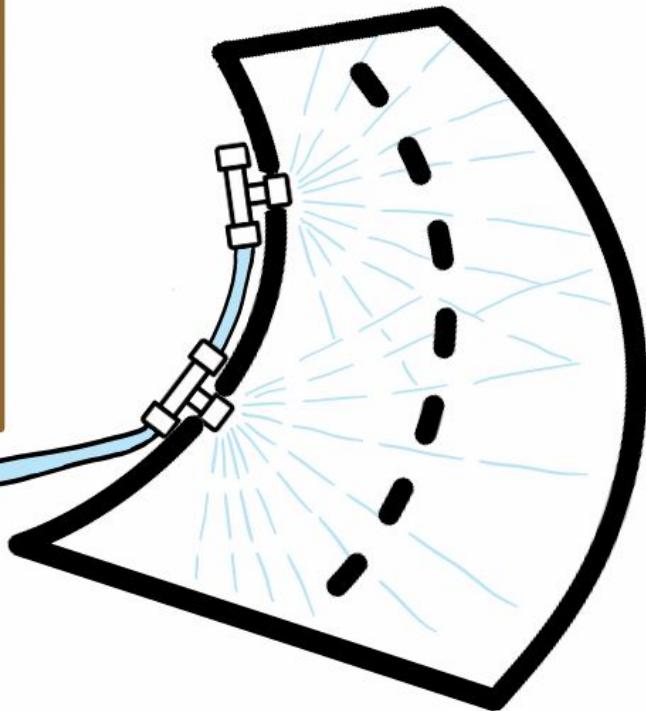
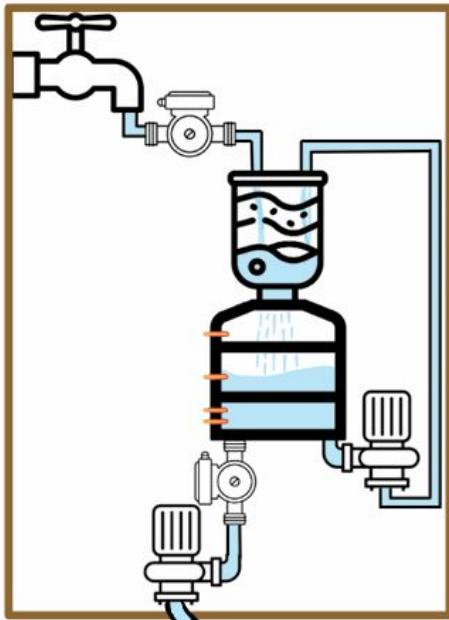




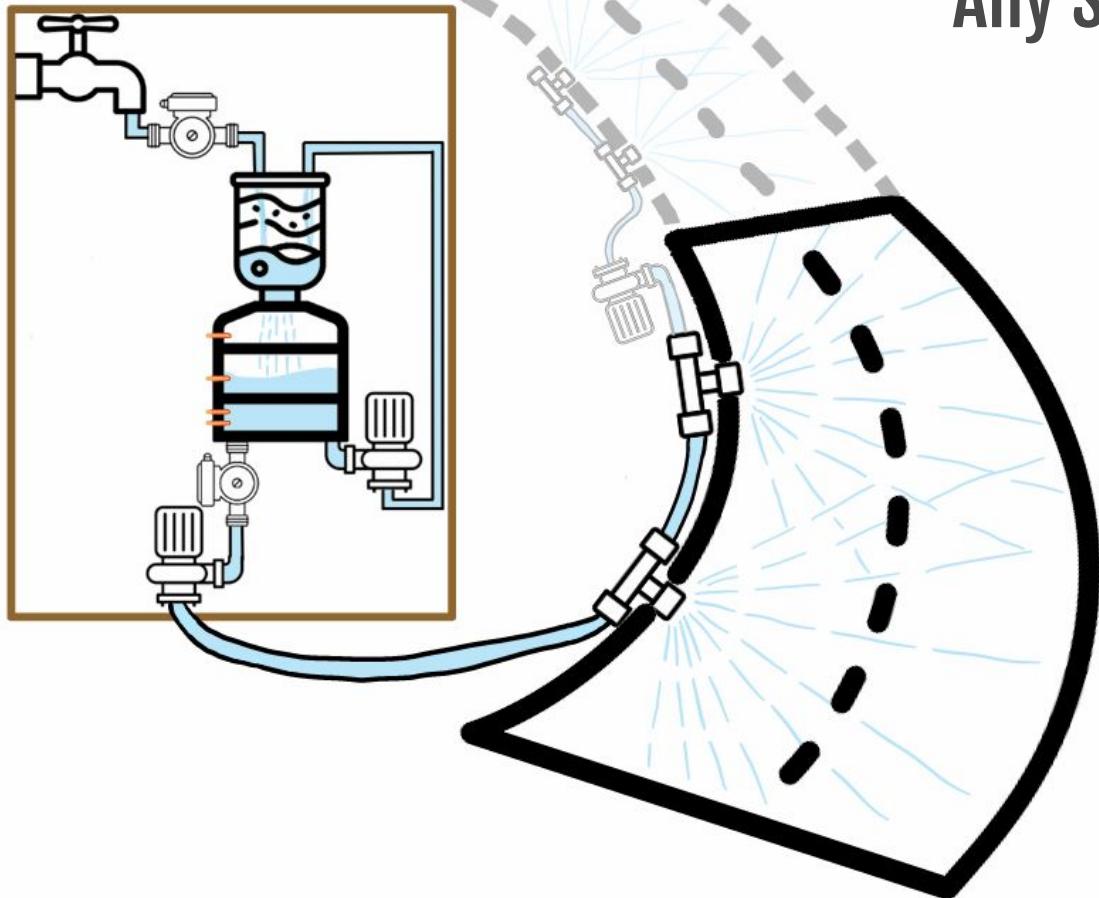
Innovative Brine Mixing and Indoor Installation of the Base Module



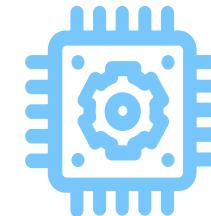
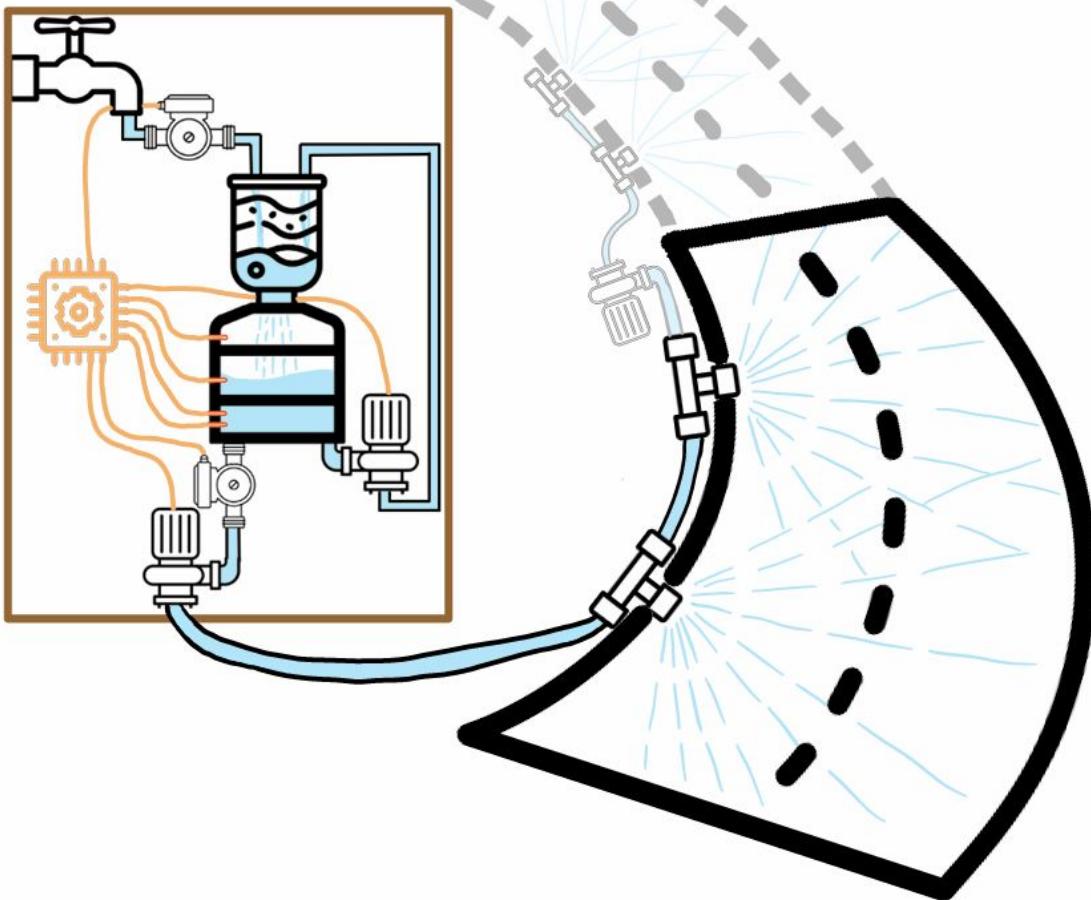
Cheap Hardware Integration for Fixation & Spraying is Key Novelty



Modular Design For use on Any Shape and Size of Ramp



ESP32 Enables Full Monitoring and Control



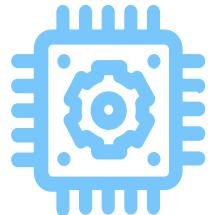
Wireless Board Computer

Automatic water refill and salt mixing

Pump and valve control

Communication with Weather API

Control from Anywhere or let ThawPal Decide for You



ESP32



ThawPal.com

Spray Now

Scheduled

Automatic



Set modes

Set parameters

Stay updated about critical
information

Boschung ThawPal Expects Positive Cash Flow by Year 2

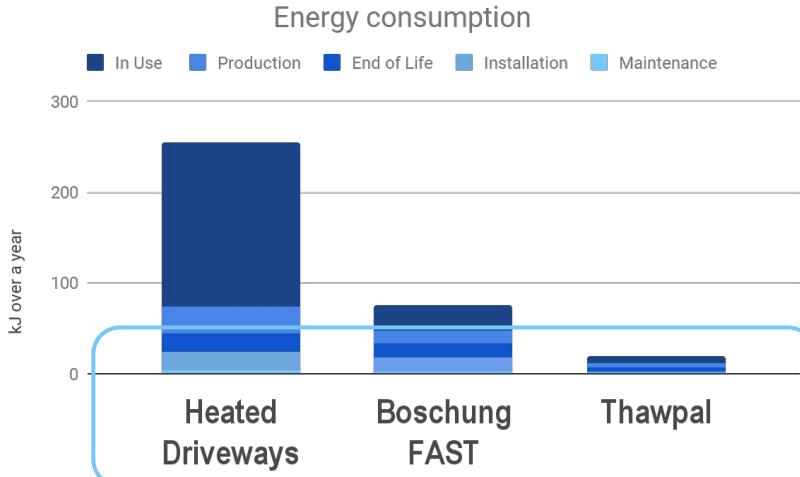
| Year | 0 | 1 | 2 | 3 | 4 | 5 |
|-----------------------------|---------|---------|---------|---------|---------|---------|
| Total Number of Sales | 0 | 30 | 60 | 90 | 120 | 150 |
| Base System | 0 | 450000 | 900000 | 1350000 | 1800000 | 2250000 |
| Spraying System 25m | 0 | 150000 | 300000 | 450000 | 600000 | 750000 |
| Subscription for 4G | 0 | 300 | 600 | 900 | 1200 | 1500 |
| Revenue | 0 | 600300 | 1200600 | 1800900 | 2401200 | 3001500 |
| Salaries with R&D | 0 | 800000 | 820000 | 840000 | 860000 | 900000 |
| Rent and Energy | 0 | 120000 | 120000 | 120000 | 120000 | 120000 |
| Website domain | 0 | 14 | 14 | 14 | 14 | 14 |
| Material Costs Base Module | 0 | 82500 | 165000 | 247500 | 330000 | 412500 |
| Machines/Initial Investment | 600000 | 0 | 0 | 0 | 0 | 0 |
| Total Cost | 600000 | 1002514 | 1105014 | 1207514 | 1310014 | 1432514 |
| Net Profits | -600000 | -402214 | 95586 | 593386 | 1091186 | 1568986 |

NPV: 170,000 CHF
IRR: 38%

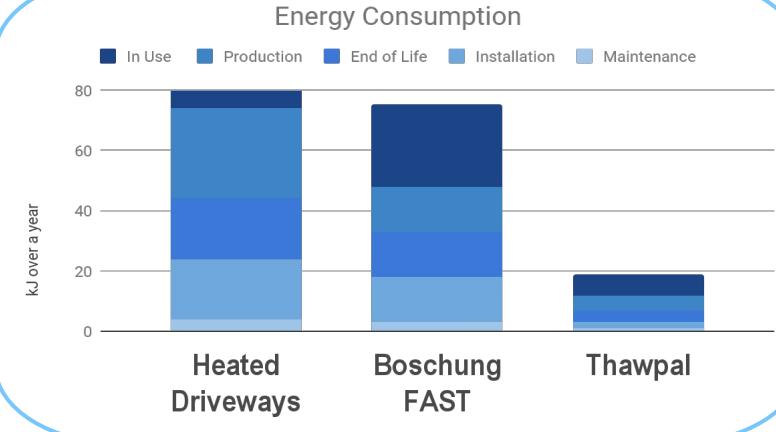
Assumptions:

- Discount Rate: 30%
- Capture around 1% of Swiss market by Year 5
- Revenue Streams: Base System (inside), spraying system (Outside) and 4G-Subscription

ThawPal Saves >90% of Energy Compared to Heated Driveways



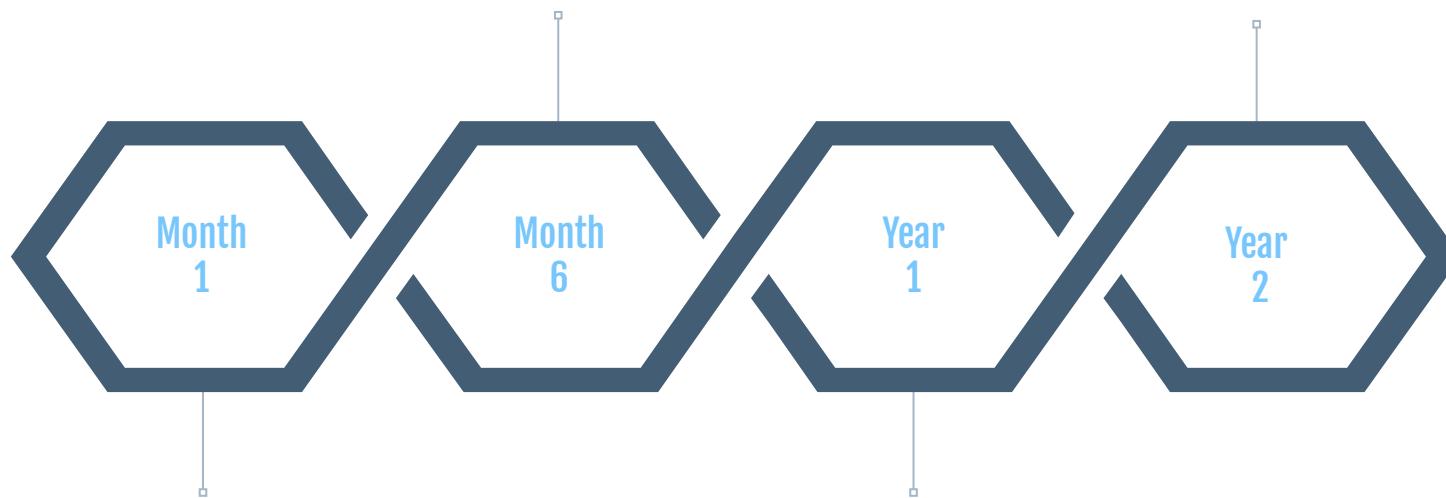
Estimate gain in energy: 93% wrt to heated driveways



Assumptions:

- 200h of critical Ice situations per year
 - Boschung FAST & ThawPal: Average 15 min of spraying per day
 - Heated Driveways: 600h per year, due to heat inertia
- Considering all expenses of energy (production, installation, maintenance, end of life)

ThawPal's Future is Industrial Production and Constant Progress



More resistance and real condition tests,
final nozzles, Fast API

Start industrial production, contacting
customers and first sells

Acknowledgements

The team would like to thank:



Daniel Esteves
Josuah Wicht



Prof. Véronique Michaud
Prof. Thomas Weber
Lorenzo Lucherini
Ru Zhang

SKIL and DLL managers

Special thank for their time and professional feedbacks to:



Dennis Money (Chef du déneigement)
Martin Ferdinand (Chef d'unité)



Hôpital du Valais
Spital Wallis

Xavier Roduit (Responsable du service technique - Hôpital de Martigny)

Thank you for listening!



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Photo Gallery



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