

# Beware the ongoing cost of owning a pilot plant

**A pilot plant facility gobbles money forever. Make sure you have deep pockets.**

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Now that the NZ Food Innovation Network has operated for a few years, we know what it costs to own and operate pilot plant. This is timely as regions eye regional development money and imagine shiny new facilities landing in their laps. Pilot plant assets require significant funding for effective operation.

## Terminology

First I want to make a key distinction: a true pilot plant is mainly to make information (about product and process), not to make product (except to taste and characterise). You want to make many prototypes quickly and cheaply – plant must be small and easy to start, stop and clean. Packing is not so important. Availability is king – ie an empty pilot plant is a virtue. You run it with people for whom data integrity and measuring variability are prime virtues. You want to have testing facilities and food science expertise readily at hand.

Further along the NPD pathway, a scale-up facility (SCUF plant) or small-scale manufacturing plant mainly makes product (perhaps for market testing). Trials are not designed to gather information (except from the market). You want short runs of finished quality product, packed, labelled and ready for sale. This must be compliant and affordable. It is important that the SCUF plant operates full to cover fixed costs. It must be run by people for whom quality and efficiency are life's main goals. And you want compliance and maintenance expertise, raw material, spare parts and waste disposal all readily at hand.

## Adding it up

The food innovation ecosystem needs both styles of plant but they are wildly different one from the other and there is a valley of death in between that must be avoided.

Both styles of facility require a building – let us say 250 m<sup>2</sup> of process floor. Treble that for chill store, freezer store, ingredient and packaging dry stores, quarantine space, retention samples, process lab and logistics areas, changing rooms and plant room, MCC room, server room, loading dock, workshop and corridors. You will need massive storage space for spare equipment not in immediate use. Then add office space, lunch room, meeting rooms and ablutions. You quickly have 1000 m<sup>2</sup>. This will cost you around \$3,500 per square metre to build and another \$500 for specialist fit out. So we need around \$4M for a small but appropriate building.

Then equipment to fit into 250 m<sup>2</sup>? Perhaps \$3 m worth if you get good deals. At any point in time, half this is on the wet floor for use and half is stacked in storage: each client has different needs.

Then you need a base-line staff to keep the place clean and the doors open. I am not including expert food technologists here, or operators or QC staff – the clients will need to find their own. Let us say we have a manager, a compliance person, a process engineer, one-only all-purpose support person to keep the place clean and working and one only office/front of house person. That sounds like \$500k annually for wages, salaries and employment-related expenses.



Then you have some base-line utilities to keep the freezers cold, the process space ventilated the lights on and line charges paid. And you have telecommunications, rates, insurances, governance, consultants, legal, accounting, marketing, training, meetings, travel and entertainment.

Let us make two big, favourable assumptions – your capital came free so you have no financing costs and you can use the land at no cost.

So to keep the doors open, you need to find:

Building depreciation at 4%	\$160k
Plant depreciation at 10%	\$300k
Wages and salaries	\$500k
Repairs and maintenance	\$40k
Other overheads	\$150k
Governance	\$50k

This means that a modest size facility is likely to cost around \$1.2M annually before it starts spending on the variable costs associated with operation.

## Potential income

A real facility of this kind, if operated very well indeed, could bill two to three days per week. Half your runs will be longer than one day, some less. Each run requires a set-up day and a clean-down day. So jam-packed full, a small facility with two only client spaces, could achieve perhaps 200 billable days per year. If we are to recover baseline costs from users, we are looking at a charge of \$6,000 per operating day just to access the room and before any variable charges. Variable costs will likely be \$500 - \$1,500 per operating day, falling on top of the daily charge.

## Who pays?

The experience in the NZFIN is that clients balk at being charged any share of this fixed cost. Smaller firms blanch at the variable costs alone.

So we tend towards having only big clients in the NZFIN facilities to minimise losses, with the small start-ups, those that we really want, sulking at home. All our experience says that someone other than the client must pay all the fixed costs – the sponsoring region. The region pays forever if the facility is to stay open. And the region pays even more to service small start-ups.

It is easy to see why even a well-run, open access SCUF plant cannot make money. Prices for food products are set between the buying public, retailers and manufacturers. Incumbent manufacturers have their plants 100% full and have spent years paring costs back – they set the market floor. The new entrant has none of those efficiencies. Client companies operating in a SCUF plant need to break even if they are to grow a new business. They need to be subsidised for a short time while they get established. The SCUF plant may need to ease the charges up month by month toward something more realistic to encourage the client company from the nest into their own premises or to a contract manufacturer. New products must meet their markets well enough to maintain a premium over the incumbent competition – some will not survive the transition.

### The pilot plant balance sheet

True pilot plants are even worse financial propositions. Clients pay even less, their need for technical expertise is higher and a pilot plant sits largely empty – because it is limited by available expert person-

hours, not by available machine-hours. The temptation is to get by with one or two generalist staff because a pilot plant seldom has a large collection of true experts. But operating a capital-rich pilot plant on a somewhat amateur basis makes no sense. The value of a true pilot plant is mainly defined by the quality of the people: the value of a SCUF plant mainly by its equipment and systems.

### In conclusion

This is why most true pilot plants round the world that have stayed alive for more than 10 years are based at universities where the educational use pays for the cake and industry use pays for the icing on top. In addition, it is why your SCUF plants have to be so very well thought out and well operated – as are the three we have in New Zealand now at Manukau, Hamilton and Christchurch. You must hit your local target market between the eyes with exactly the right kit to support first manufacture.

So please bear in mind: a small working floor area demands a large building area and heavy mechanical servicing. This is expensive. You cannot dodge the costs. You cannot offload them on to your target client. You must have deep pockets to keep it going year after year after year.

And then, make sure you have very deep pockets, each and every year into the future.



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