It’s a hard life being a production engineer, as those in the trade will testify. Not only are they the ‘firefighters’ of the production department, responding with diplomacy to the demands of operations directors, machine shop managers, quality inspectors and design engineers, but they are also expected to be the font of all knowledge. However, manufacturing is a prodigious subject even for the most accomplished and experienced of production engineers.

Take fabrication, for example: it is not always straightforward, when presented with a drawing for a sheet metal component that includes a series of bends, to know which technology is best suited. And while batch quantity, component complexity and budget will provide some indication, it is still a decision that requires careful research and deliberation. The suppliers, of course, have their own views.

“The cut-off point between manual and CNC press brakes is usually determined by how complex the part is,” states sales manager at Press & Shear Machinery, Barry Webster. “If it is fairly simple, with flange sizes the same and similar angles around the part, then a basic machine will probably suffice. However, if there are several different flange sizes and a variety of angles, then setting time would exceed the bending time and CNC would be the way to go.”

Press brakes have an unflattering image in manufacturing as cumbersome, low-technology machine tools. But recent developments are challenging that. For instance, Press & Shear Machinery now markets a range of downstroking five-axis CNC press brakes from Guifil with approach speeds up to 200 mm/sec and return speeds 50 per cent faster still.

But as Mr Webster points out, technology selection is so often dependent on component type. Essex-
based contract fabricator Goldway Networks, for example, recently purchased two Guifil press brakes to satisfy orders for larger components. The machines have a 3 m capacity and up to 160 tonne bending force. A specification is something that a customer and a supplier can usually quickly conclude to satisfaction, as in this case. "Certainly the equipment that we have bought has provided the return we were looking for," says proprietor John Bedding.

So where do panel benders fit into the equation? "If the decision is based on price alone," outlines Jon Grainger, UK sales manager at Salvagnini, "a newly installed press brake will cost from £50 000 entry-level, up to £150 000 for top of the range. An entry-level panel bender comes into the market at £210 000 and this can typically do the work of two or three press brakes. A company may justify its purchase of a panel bender due to the market trend for smaller batches — a press brake typically takes 10-15 minutes to set up, but a panel bender can take three minutes or less."

According to Salvagnini, the company's entry-level Performer panel bender also has the ability to handle sensitive materials such as plastic-coated and pre-painted materials without the tell-tale witness marks generated by press brake tooling. Sheet size is also a factor. "If panel sizes are large," continues Mr Grainger, "or if the weight of the part is excessive for one operator to constantly manipulate, then a press brake can often require two operators. However, using a panel bender, lengths of up to 3200 mm can be accommodated with only one operator ‘minding the process’."

In 2000, Devon-based Greenfield Engineering started researching the methods available for forming/bending sheet metal. The company looked at press brakes and press brakes with robots, then visited exhibitions such as MACH and EuroBlech to trawl all of the new technology on offer before making a decision. Conscious of the fact that there are plenty of contract fabricators in the UK market, founder and managing director Frank Green was determined to find something that would elevate Greenfield above the competition.

THE GAMBLE PAYS OFF
Greenfield settled for a Performer compact panel bender from Salvagnini and, 18 months on, it appears to have had the effect that Mr Green was looking for. "It was a gamble for Greenfield," he says. "But in actual fact we have had 100 per cent uptime and no problems with the machine whatsoever. When I say that we have a Salvagnini, people ask ‘what do you manufacture?’ When I say that we are a contract manufacturer they say, ‘wow, a contract manufacturer with a Salvagnini’ and all of a sudden they want to come down and see our operation."

Another supplier of panel bending technology, John Murray Machinery, is also of the opinion that the distinction between a press brake and a bending centre can only be assessed on a case-by-case basis. The company insists that if a manufacturer has enough production of suitable parts to keep four or five press brakes busy, as well as the finance and the vision, then it should consider a bending centre. While the price is higher, this is recouped by an increase in productivity and the added benefits of reduced manning and set-up time, as well as increased repeatability.

One company that has progressed from a press brake to a bending centre is Plymouth-based Westwood Automation, which purchased a RAS CNC Multibend Centre 79.26 from John Murray Machinery. The company produces a range of lockable shed and garage tooling cabinets and the savings that it has achieved, compared to CNC press brake operation, are impressive. Production times on some sections have been reduced by 70 per cent with set-up in some cases cut from 60 minutes to less than one minute.

The new technology has also allowed Westwood to make design modifications. For example, drawer fronts are now integrated into the base and produced from a single blank, eliminating welding and bolting operations. Owner of Westwood Automation, Gerry Hazelwood, says that previously it took typically 90 seconds to form a part with eight bends on a press brake and that the Multibend Centre completes the same part in under 30 seconds.
However, new innovations are rapidly enhancing press brakes, making them easier to implement and use than ever before. Scott Simpson, general sales manager at Trumpf says that accuracy, speed, and ease of use are among the advantages that a CNC press brake user can expect over a manual machine, adding that graphical displays are also a big benefit, taking the operator through the bend sequence step by step. But as clever as developments of this nature are, many cannot see beyond the cost of CNC.

Because of the labour element of press-braking operations, the productivity of the machines is not as easy to assess and quantify as on fully automated equipment. Machine attributes such as flexibility and build quality are often regarded as so subjective and ‘unquantifiable’ that they are often missed during formal justification. To try to alleviate some of the cost barrier, Trumpf launched its TrumaBend C series entry-level package at its In-Tech open house exhibition earlier this year. The C series features automatic compensation for deflection, a programmable back gauge, a new four-cylinder ram and Trumpf’s crowning system.

Press brake technology is far from succumbing to the ‘labour-intensive’ tag. Trumpf’s BendMaster for instance offers automatic bending, even for small batch runs. BendMaster is installed directly in front of a press brake and its 180° overhead loading makes it possible to work with pallets in a practical fashion while maintaining free access for a forklift. Trumpf claims the robot device is equally well suited to high or low production runs (as little as 30-off) due to its short programming and set-up times. It also has the flexibility to work with parts weighing up to 40 kg as well as light, complex components.

Pullmax has not sold a manual press brake for over 12 years, claiming that modern technology has considerably reduced the gap between CNC and manual machines. The company outlines that fast set-up time is a big advantage for CNC users, especially on repeat work. On a manual machine, if 50-off parts with three bends were required, for example, the approach would be to do 50 first bends and 50 second bends. It is not until the third bend that the part can be determined as correct or not, whereas on a CNC press brake it is easy to try one-off before proceeding with the batch, saving a lot of time and wasted material.

Pullmax markets the Bystronic Hammerle range of press brakes, one of which has just been sold to Flexi Fabrication in Dublin.

Manual machines have suffered a similar fate at LVD. “For the past three years, LVD has only been offering CNC machines due to the improvements in accuracy and reduction in set-up times associated with CNC,” clarifies product manager, Steve Williams. “Generally, budgets of less than £35 000 will rule out most reputable CNC machines. Manual press brakes have one advantage – cost, but when resale values are considered, the gap can be reduced as most used machine dealers prefer to sell good, used multi-axis CNC machines.” As a matter of interest LVD is now finding that many of its customers are now considering the advantages offered by using ‘in-process angle’ measuring systems, which adjust the required bend position dependent upon material thickness, tensile strength and grain direction.

According to LVD, by using this system, scrap and set-up times can almost be eliminated. Indeed, the company says that it has been installing a large number of its Laser Easy systems to press brakes within the UK.