**FACILITIES**

The current (no pun intended) electrical power in countries outside the USA is 230 Volt 50 Hz, and can be provided in your building from a 100 Amp Control Panel Box dedicated to welding machines and metal fabrication electrical tools such as angle grinders.  If you want to be able to do some welding outside as well as inside, so an additional outlet or two will also be needed for that.  Outlets for stick/welders should be 50-Amp.  The Wire-Feed Flux Core welders angle grinders, and cutoff-saws usually only require 20-Amp service.  Special high-amperage extension cords made especially for welders can be used to provide more flexibility on welding locations in or around the building.

**WELDERS**

Light-weight steel welding (such as furniture framing) is difficult to do with a stick/arc welder due to "burn-thru", so I am recommending a wire-feed flux-core welder for that work.  The heavier-duty (greater than 1/8th thickness) welding would be best served by a stick/arc welder.  Both welders need to be 220 Volt 50 hz machines which are available outside of the USA, and you can purchase those in Cambodia, Kenya, etc.  The machines sold in the USA are either 110/120 Volt 60 hz or 220/240 Volt 60 hz machines, and they will not work well for the 230 Volt 50 hz electrical power available in Cambodia.  The 110/120 Volt equipment wont work outside the USA without a powerful transformer, and I don't recommend it.  The 220-240 Volt 60 Hz machines in the USA will still work overseas, but will not provide the same amperage capability as the 230 Volt 50 Hz machines sold in Cambodia, Kenya, and other countries outside of the USA.

**WELDING/FABRICATION EQUIPMENT**

In order to do any metal fabricating, you also need equipment to cut, grind, and brush (clean) the metal that you are using.  You can easily spend several hundred dollars on a metal cutoff saw, slag hammers, wire brushes, angle grinders, C-clamp pliers, etc.  I recommend that you start out with two light duty 4.5" angle grinders and two medium duty 4.5" angle grinders, each of which will cost around $25-50. If you have two workers doing welding/fabrication at the same time, they will each need enough tools to do the work.  You would need those items even if you had a cutoff saw, and the angle grinders can be used for cutting, grinding, and brushing.  I use one angle grinder for cutting, one for light-medium grinding, one for heavy grinding, and one for brushing.  Trying to use one angle grinder for everything (cutting, grinding, brushing) requires frequent changing of wheels, and causes the grinder to wear out prematurely, plus you end up wasting too much time changing from one to another.

C-clamp pliers are needed for any/all of the welding/fabrication projects, and I typically use 1-5 at the same time, depending on what I am doing.  The Irwin VISE-GRIP Locking C-Clamp Pliers cost double the amount of cheap ones, but they work best and last for many years.

**SAFETY**

Welding and metal fabrication is dangerous work, but proper safety equipment and instruction can help mitigate those risks.  Cuts, scrapes, and burns are a common occurrence when welding and fabricating with metal.  Angle Grinders are extremely dangerous and can quickly cause deep, ugly cuts.  Fire is a extreme hazard from both welding (sparks) and from cutting/grinding (more sparks).  A good knowledge of First Aid/CPR for everyone in the shop plus a good First Aid Kit can be the difference between life and death.  Angle grinders cut through anything, and they can cause terrible, ugly cuts or amputations in a matter of seconds. Knowing how to stop the bleeding can save a life.

At lease two welding helmets will be required...one for the instructor and one for each student.  Auto-darkening welding helmets/hoods are available for under $50 each.

Welding blankets could be used as screens to contain sparks to a particular area so as not to start fires in the wood shop.  You can make a simple frame to hold a blanket (4' x 6') and you can use them as portable partitions inside or outside to catch sparks, metal debris (splinters, etc), and they can be used as a shield to keep other people from being blinded by the welding flash.  Building the partition frames would be a good learning project for the people learning their new welding skills.

Leather gloves for welding and fabrication are a must, and they will wear out very quickly.  Gloves for welding are heavier than the ones that are needed for other work, but the thinner light-weight gloves are also needed when working with metal but not welding. A leather welding jacket or apron can also provide protection from sparks, metal splinters, and possibly deflect a angle grinder that slips.

Eye protection in the form of Safety Glasses and/or Safety Goggles are required for obvious reasons, and they need to be replaced more often than you might think.  They become scratched easily, and then they are a safety issue because you cannot see clearly. Breathing barriers (masks or respirator) can help prevent workers from breathing the toxic fumes/smoke that are present while performing welding/fabrication.

**CONSUMABLE ITEMS**

Cutting discs, Grinding discs, and Wire brushes for 4.5" Angle Grinders...

Cutting discs wear out quickly and sometimes break if used improperly or abused.  This will be an item that will be replaced often.

Welding rods come in several different types/sizes such as E6011. E6013. E7018.  The typical size (diameter) is 3/32", 1/8", or 5/32".  The smaller size is used for light-weight welding, and the largest is for heavy-duty welding.  The type of welding that your crew will be doing will probably be best served by E6011 rods that are either 3/32" or 1/8".

Metal, including angle iron, square tubing, round tubing, steel plate, etc can be expensive, so be prepared to spend some cash and try to get some good sources for material.