CLAIMS:

1. A unified power flow controller provided at a point of power consumption for regulating voltage received from an electric utility grid, the unified power flow controller comprising:

a terminal electrically coupled to a power source that originates from the electric utility grid, the terminal receiving a grid alternating current and a grid alternating voltage;

a power converter electrically coupled to the terminal, the power converter comprising:

a display configured to prompt users at the point of power consumption to provide energy saving parameters;

an active rectifier configured to convert of the grid alternating current to a direct current; and

an inverter configured to convert the direct current to a load alternating current and a load alternating voltage, the load alternating voltage being less than the grid alternating voltage, the load alternating current including at least one of a load real power component and a load reactive power component;

a transformer having first terminals electrically coupled to the power source and second terminals electrically coupled to an output of the inverter, the transformer being adapted to inject the load alternating voltage in series with the grid alternating voltage; and

a switch provided across the first terminals of the transformer to bypass the transformer and provide the grid power source directly to the point of power consumption.

2. The unified power flow controller of claim 1, wherein the transformer is configured to inject the load alternating voltage in-phase with the grid alternating voltage to increase a value of the grid alternating voltage delivered to the point of power consumption.

3. The unified power flow controller of claim 1, wherein the transformer is configured to inject the load alternating voltage out-of-phase with the grid alternating voltage to decrease a value of the grid alternating voltage delivered to the point of power consumption.

4. The unified power flow controller of claim 1, wherein the inverter generates the load alternating current at a fixed frequency.

5. The unified power flow controller of claim 1, wherein the power converter further comprises an energy storage device configured to store energy supplied by the direct current, wherein the energy storage device includes at least one of a battery or a capacitor.

6. The unified power flow controller of claim 1, further comprising a microcontroller configured to receive energy saving parameters at the point of power consumption, the energy saving parameters including at least one of a desired root-mean-square voltage value, a desired voltage reduction percentage, and a desired savings reduction percentage.

7. A method of regulating voltage at a point of power consumption, the voltage being received from an electric utility grid, the method comprising:

receiving a grid alternating current and a grid alternating voltage originating from the electric utility grid;

prompting users at the point of power consumption to provide energy saving parameters;

converting of the grid alternating current to a direct current;

converting the direct current to a load alternating current and a load alternating voltage, the load alternating voltage being less than the grid alternating voltage;

injecting the load alternating voltage in series with the grid alternating voltage in a first configuration; and

providing the grid power source directly to the point of power consumption in a second configuration.

8. The method of claim 7, wherein the load alternating voltage is injected in-phase with the grid alternating voltage to increase a value of the grid alternating voltage delivered to the point of power consumption.

9. The method of claim 7, wherein the load alternating voltage is injected out-of-phase with the grid alternating voltage to decrease a value of the grid alternating voltage delivered to the point of power consumption.

10. The method of claim 7, wherein the load alternating current includes at least one of a load real power component and a load reactive power component.

11. The method of claim 10, wherein the load alternating current is generated at a fixed frequency.

12. The method of claim 7, further comprising storing energy supplied by the direct current, the energy being stored in at least one of a battery or a capacitor.

13. The method of claim 7, further comprising receiving energy saving parameters at the point of power consumption, the energy saving parameters including at least one of a desired root-mean-square voltage value, a desired voltage reduction percentage, and a desired savings reduction percentage.

14. A non-transitory computer-readable storage medium having stored therein instructions which, when executed by a microprocessor, causes a unified power flow controller provided at a point of power consumption to:

receive a grid alternating current and a grid alternating voltage originating from the electric utility grid;

prompt users at the point of power consumption to provide energy saving parameters;

convert of the grid alternating current to a direct current;

convert the direct current to a load alternating current and a load alternating voltage, the load alternating voltage being less than the grid alternating voltage;

inject the load alternating voltage in series with the grid alternating voltage in a first configuration; and

provide the grid power source directly to the point of power consumption in a second configuration.

15. The non-transitory computer-readable storage medium of claim 14, wherein the instructions, when executed by the microprocessor, cause the unified power flow controller to inject the load alternating voltage in-phase with the grid alternating voltage to increase a value of the grid alternating voltage delivered to the point of power consumption.

16. The non-transitory computer-readable storage medium of claim 14, wherein the instructions, when executed by the microprocessor, cause the unified power flow controller to inject the load alternating voltage out-of-phase with the grid alternating voltage to decrease a value of the grid alternating voltage delivered to the point of power consumption.

17. The non-transitory computer-readable storage medium of claim 14, wherein the instructions, when executed by the microprocessor, cause the unified power flow controller to store energy supplied by the direct current, the energy being stored in at least one of a battery or a capacitor.

18. The non-transitory computer-readable storage medium of claim 17, wherein the instructions, when executed by the microprocessor, cause the unified power flow controller to generate the load alternating current at a fixed frequency.

19. The non-transitory computer-readable storage medium of claim 15, wherein the instructions, when executed by the microprocessor, cause the unified power flow controller to receive energy saving parameters at the point of power consumption, the energy saving parameters including at least one of a desired root-mean-square voltage value, a desired voltage reduction percentage, and a desired savings reduction percentage.