2_2, . . . which may lie in the same column, such that the (+) harvested energy output node is a conductor of a bus row segment **6** at a top boundary of the PV system, while the (−) harvested energy output node is a conductor of a bus row segment **6** at a bottom boundary of the PV system. A bus management circuit **5** that is not at the boundary of the PV system can be programmed to alternately connect and disconnect to each other a) a bus conductor from any one of its four adjacent bus group segments and b) a bus conductor from any other one of its four adjacent bus group segments, providing maximum flexibility in defining a power path.

[0026] For the example of FIG. **2**, it can be seen that additional columns of sub-arrays can be connected to each other in series similar to the one in FIG. **2**. If these additional series-connected columns happen to be adjacent to another, then all of these columns can also be connected to each other in parallel, along the top and bottom rows of the PV system, by programming the bus management circuit **5** that is at the boundary, to create a further current path from its left bus row segment **6** to its lower bus column segment **7**.

[0027] The power grid of FIG. **2** can be reconfigured so that power paths are created therein that enable a parallel, rather than a series, connection of the sub-arrays **2_1**, **2_2**, . . . This is depicted in the example of FIG. **3**. If additional current is desired, then additional parallel-connected columns of sub-arrays can be created, and these may be placed in parallel with each other by suitably programming the bus management circuits **5** at the top and bottom boundaries of the PV system.

[0028] It should be noted that while the full mesh capability of the internal current path switches of the circuits **4**, **5** described above can provide the greatest flexibility in creating power paths in the power gird and between sub-arrays, an alternative is to restrict the number of current path switches so that the circuit **4** or **5** has less than a full mesh capability. This may be acceptable so long as the desired power paths can be created in the power grid, and a desired level of granularity of the configurability of the PV system as a whole, including granularity of the connections between sub-arrays, can be met.

[0029] Still referring to FIG. **2**, in accordance with another embodiment of the invention, the remote light beam source can encode power transfer configuration instructions or other data (e.g., instructions for controlling the power system configuration or other sub-system such as the ADCS, COM, etc.) by imposing a high frequency component onto the light beam. That information is then detected through an electrical node that is capacitively coupled to the PV cells, while the DC component is being harvested for power. An example is shown in FIG. **2** where the ac signal can be out-coupled through a series capacitor connected to the harvested energy output node, to a communications band decoder. The latter translates or decodes the information or data signal for use by the EPS controller for example, to use in configuring the power management circuits and/or determining for example that the incident light is a remotely sourced light beam, rather than sunlight, and/or for controlling other sub-systems.

[0030] Turning now to FIG. **6**, a sub-array power management circuit **4** is depicted that has a dc-dc converter coupled between the sub-array output nodes (of its associated sub-array **2**) and the power grid. Note that in this particular example, the current path switches (that serve to alternately connect and disconnect the sub-array **2** to the power grid) are "in front" of the dc-dc converter circuitry, so that when the sub-array **2** is disconnected from the grid, the dc-dc converter automatically sees essentially Volts at its input. While it is possible to allow the dc-dc converter to also be controlled through the communications grid **9** (as shown here via the communication interface of the circuit **4**), for example as to how much to boost the output voltage or at what voltage to regulate, this is not needed in all instances because a fixed boost or regulated voltage may be set. Using the dc-dc converter as a boost converter, the PV system can provide a boosted output voltage at its harvested energy output nodes, while advantageously distributing the task of dissipating the heat produced by the overall boost conversion process, to the various locations of the sub-arrays (rather than to a centralized location outside the PV system). The use of a dc-dc converter in this manner may be viewed as an alternative to the embodiment described above where a sufficient number of sub-arrays **2** are connected in series (by appropriately configuring the power paths in the power grid) in order to produce a high output voltage, or it may be used in conjunction with the series configuration of FIG. **2**, for example, so as to obtain the highest available voltage from the PV system (as the sum of the output voltages of a number of sub-array power management circuits **4** that also have boost converters as depicted in FIG. **6**).

[0031] Returning briefly to FIG. **2**, this figure also serves to illustrate another embodiment of the invention, namely a specific application or integration of a dynamically reconfigurable PV system in a spacecraft. In such an application, the spacecraft has an electrical power system (EPS), which includes (in addition to the PV system) a controller **8** and a power distribution network **10**. The EPS distributes power from the harvested energy output nodes of the PV system to other components of the spacecraft, namely a rechargeable battery, an on-board computer (OBC), a communications subsystem (COM), and an attitude determination and control system (ACDS). As suggested above, this may call for low, medium and high voltages to be alternately available on the harvested energy output nodes dynamically, i.e. during normal use or deployment of the satellite. The reconfigurable PV system described above may meet such requirements, when the EPS controller **8** has been programmed to configure the power and bus management circuits **4**,**5** via the communications grid **9**, to set the high or low voltage at the harvested energy output node.

[0032] Turning now to FIG. **7**, this figure depicts an embodiment of the invention where the PV cell **3** is a multi-junction cell, and a cell-level or multi-junction power manager circuit **14** is provided for each such cell, to produce the cell output voltage. As was suggested earlier, one or more of the cells in each sub-array **2** may be multi-junction cells, wherein each multi-junction cell has two or more junctions (e.g., p-n junctions) for collecting the photo-generated current, and wherein each of the junctions is independently coupled to the multi-junction power manager circuit **14**. The different junctions (the example here referring to three junctions A, B, and C) may each be tuned or optimized to produce the most electricity when absorbing a different color or wavelength of light. Each of the photocell junctions that make up a multi-junction PV cell is coupled to a separate input port of the power manager circuit **14** associated with that multi-junction PV cell. As such, the energy harvested by every one of the photocell junctions is provided to the power grid through the same output port of the power management circuit **14**. The power manager circuit **14** which is managing the power coming from the different junctions within the multi-