Figure S1. Flow diagram explaining the procedure of intercalibration.

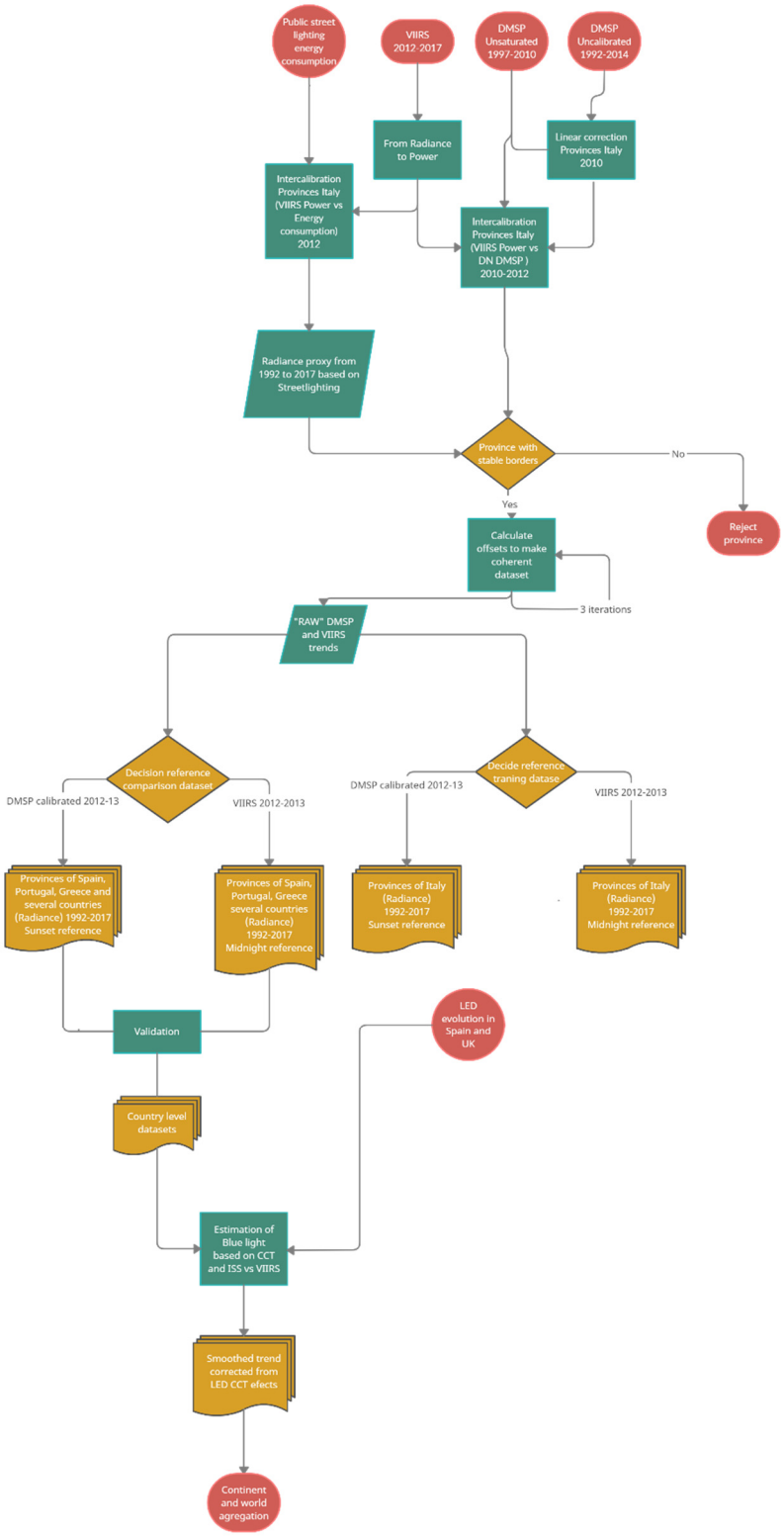


Figure S2. Predicted vs. measured power of street lighting for countries and years within the study period for which it was available: Brazil, Croatia, Czech Republic, Denmark, France, Germany, Greece, Ireland, Norway,

Portugal and Switzerland. Measured power obtained from publicly available data from national and regional governments in each case.

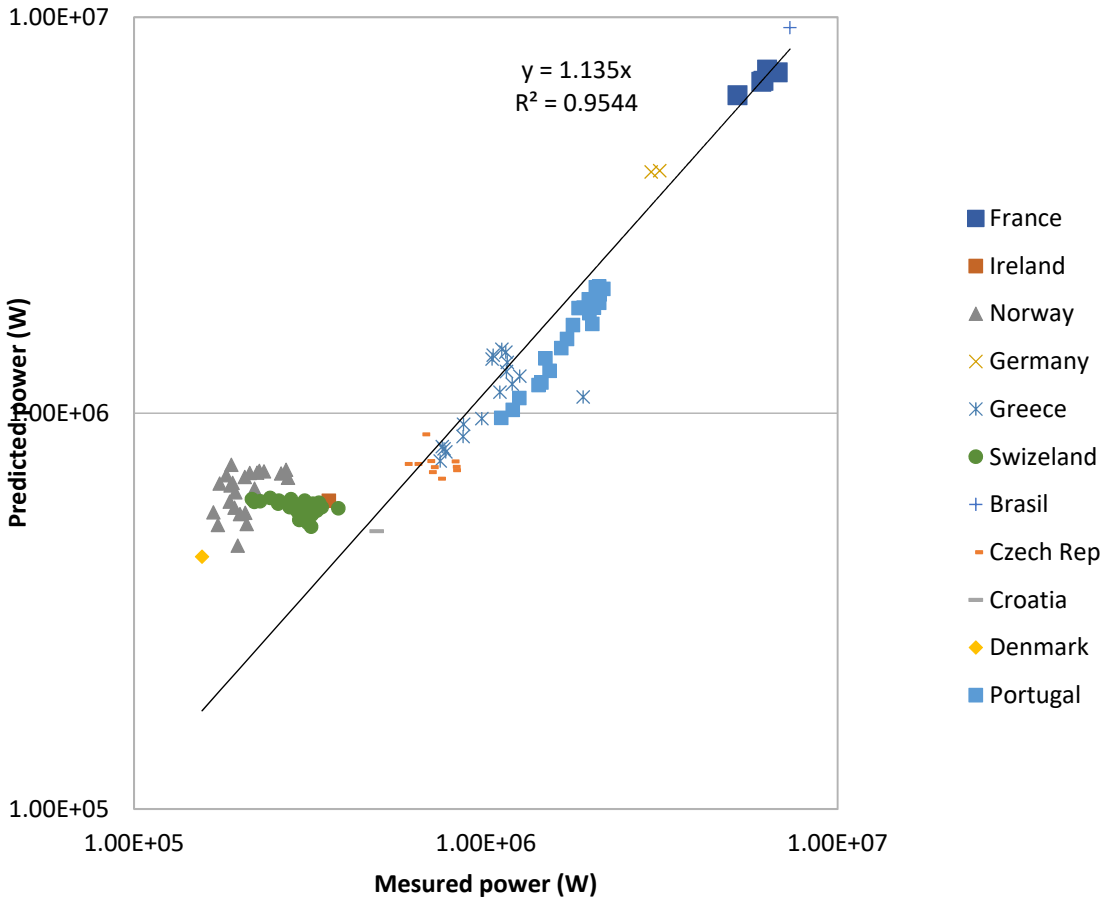


Figure S3. Example of test of the trends for Portugal, Italy, Greece and Spain. In blue are the DMSP uncalibrated data, in green the DMSP calibrated and in red the VIIRS data. In black, the estimated power expected from the street lighting statistics. These plots are using the midnight reference, aka. VIIRS. In the case of Spain, [33] showed how the national values were not relible but that some of the provinces were reliable. Data for Greece were like those for Portugal but on a smaller scale. We found that the statistics have a delay of 2-3 years because they correspond not to the actual year when the energy is used but when the payment is efectively done (Private comunication Victor Kouloumpis for Greece and Raul Lima for Portugal). Note that the economic crisis was visible in the night lights trend of Greece way sooner than for Spain, Italy or Portugal. In Greece the change of slope happened in 2006, while in Portugal, Spain and Italy it happened in 2008-9. All before LEDs were introduced.

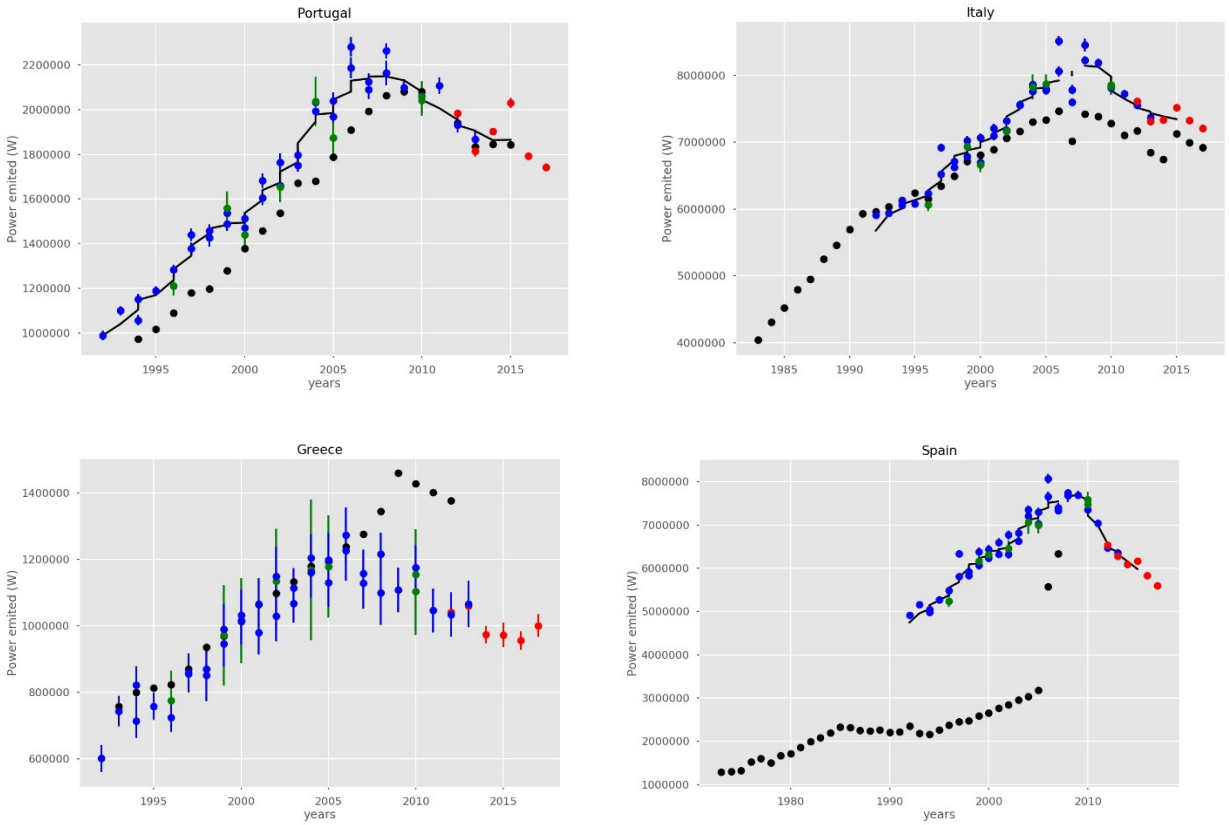


Figure S4. Example of test of the trend of regions of Faro (Portugal), Grosseto (Italy), Thessaloniki (Greece) and Cantabria (Spain). In blue are the DMSP uncalibrated data, in green the DMSP calibrated and in red the VIIRS data. In black, the estimated power expected form the street lighting statistics. The four provinces have very diferent behavior, but smooth trends that match the slope of the correponding estimation from street lighting energy consumption. The regions are in some cases provinces in other NUTS, depending on the avialability of the street lighting statistics and shape files. Spain, Italy and Greece correspond to NUTS3, and Portugal to provinces.

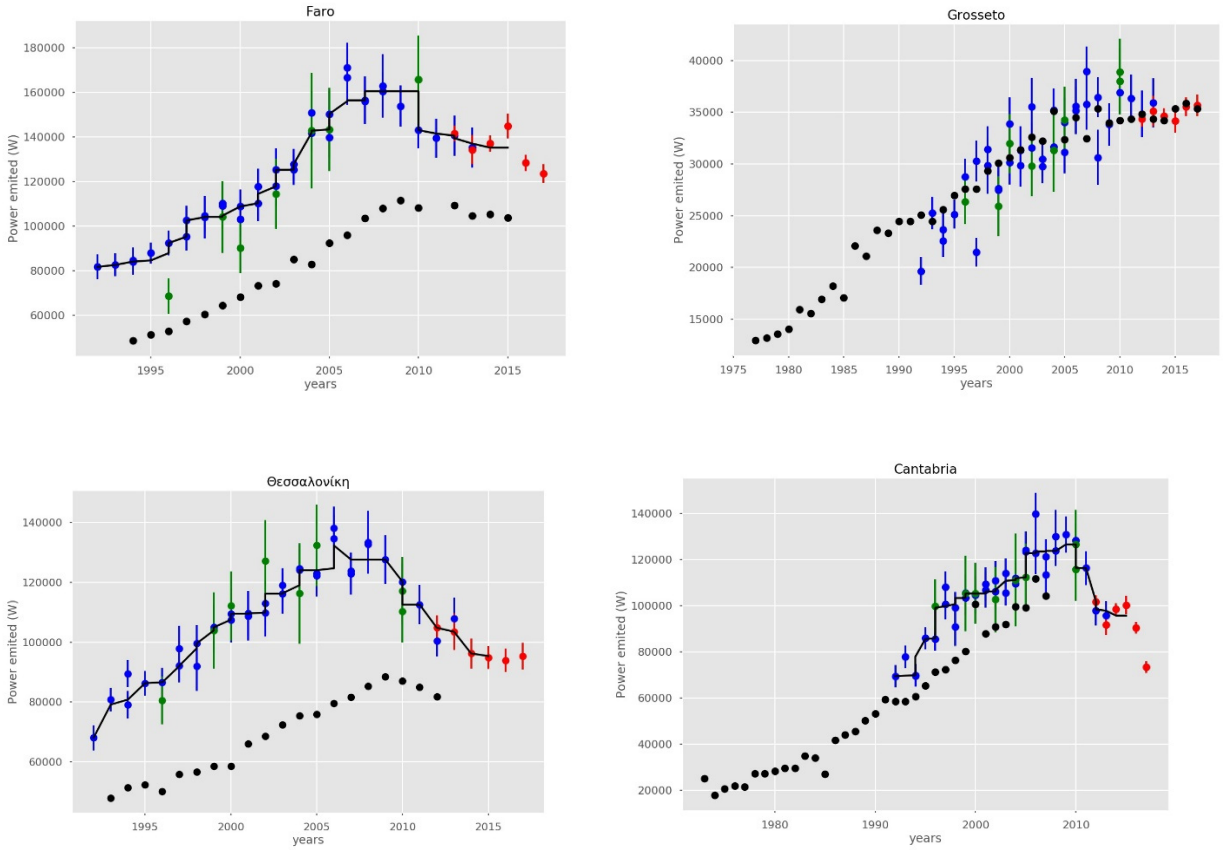


Figure S5. Relationship between DMSP OLS 2010-2011 and SNPP/VIIRS/DNB 2012 for Italian provinces.

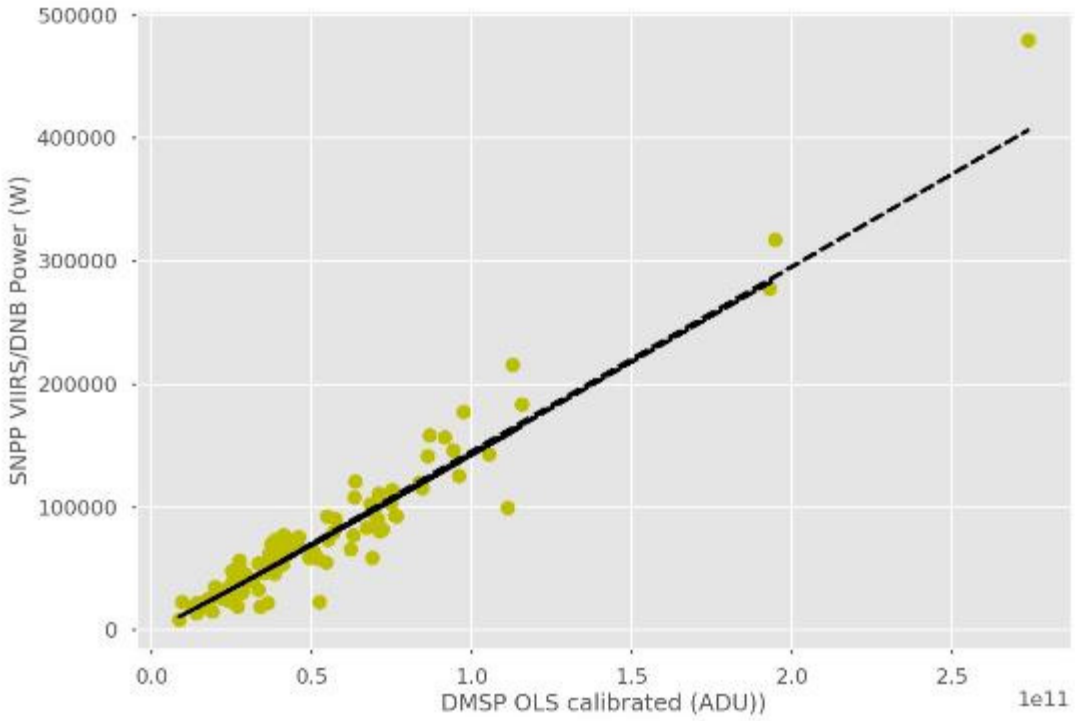


Figure S6. Ratio of DMSP/OLS, VIIRS-DNB, versus G/R ratio from the ISS. Calculated following the same procedure as [24]. Same legend as plots in [24]. For any given spectra, the diference is lower than 15%, with the exception of black body lamps, that can reach 20% maximun.

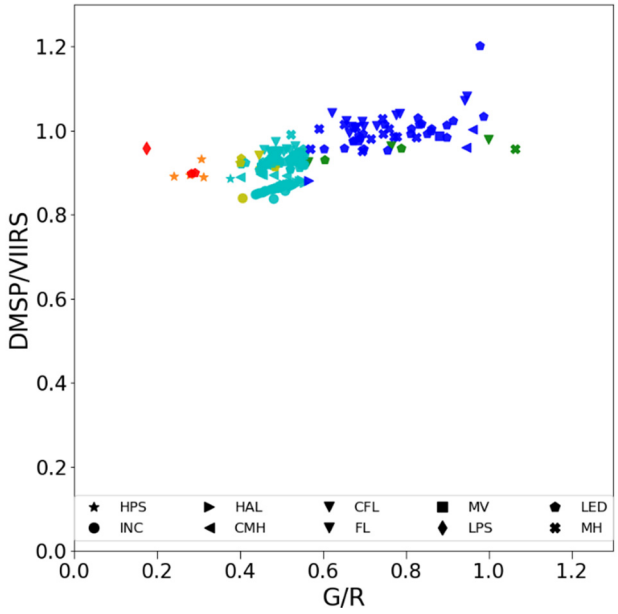


Figure S7. Examples of not rescaled raw DMSP, calibrated DMSP and VIIRS for diferent locations in Italy. In blue are the DMSP uncalibrated data, in green the DMSP calibrated and in red the VIIRS data. In black, the estimated power expected form the street lighting statistics. The gap between calibrated DMSP 2010 and VIIRS 2012 can give an estimation of how much of the light is emited in the first part of the night and how much in the second part. As can be seen, for three of the provinces, this gap is smaller than 10%, with the exception of Grosseto. Grosseto is also the least bright province so, more suceptible to being affected by single instalations. The gaps for Frosinone, Pisa and Macerata can easily by explained by the regular evolution of the street lighing.

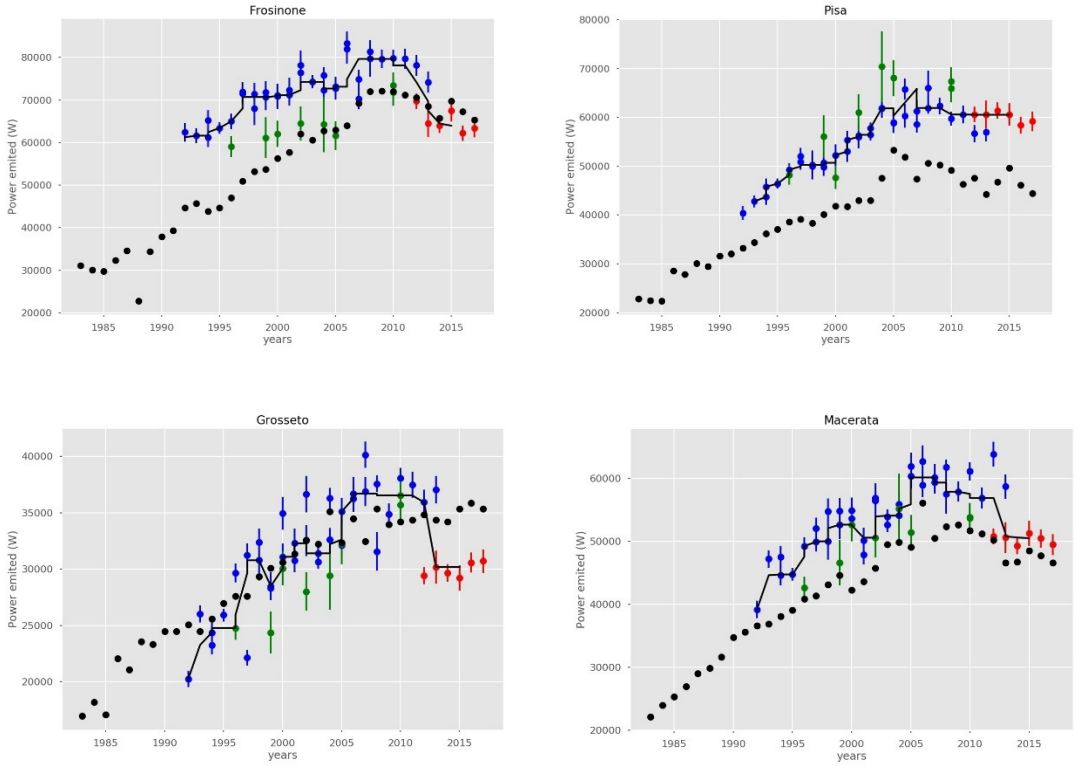


Figure S8. Examples of not rescaled raw DMSP, calibrated DMSP and VIIRS for different locations in continents. In blue are the DMSP uncalibrated data, in green the DMSP calibrated and in red the VIIRS data. The gap between calibrated DMSP 2010 and VIIRS 2012 can be explained because of the time of observation, first during the evening, second during midnight. This gives information on the amount of variable lights on each continent. Europe, North America, Asia and Oceania have big gaps, probably because of the turning off of private lighting, although for Africa and South America this gap is much smaller. DMSP 2010 in Europe is an outlier because of the large amount of data with snow in north and mid Europe used for that composite.

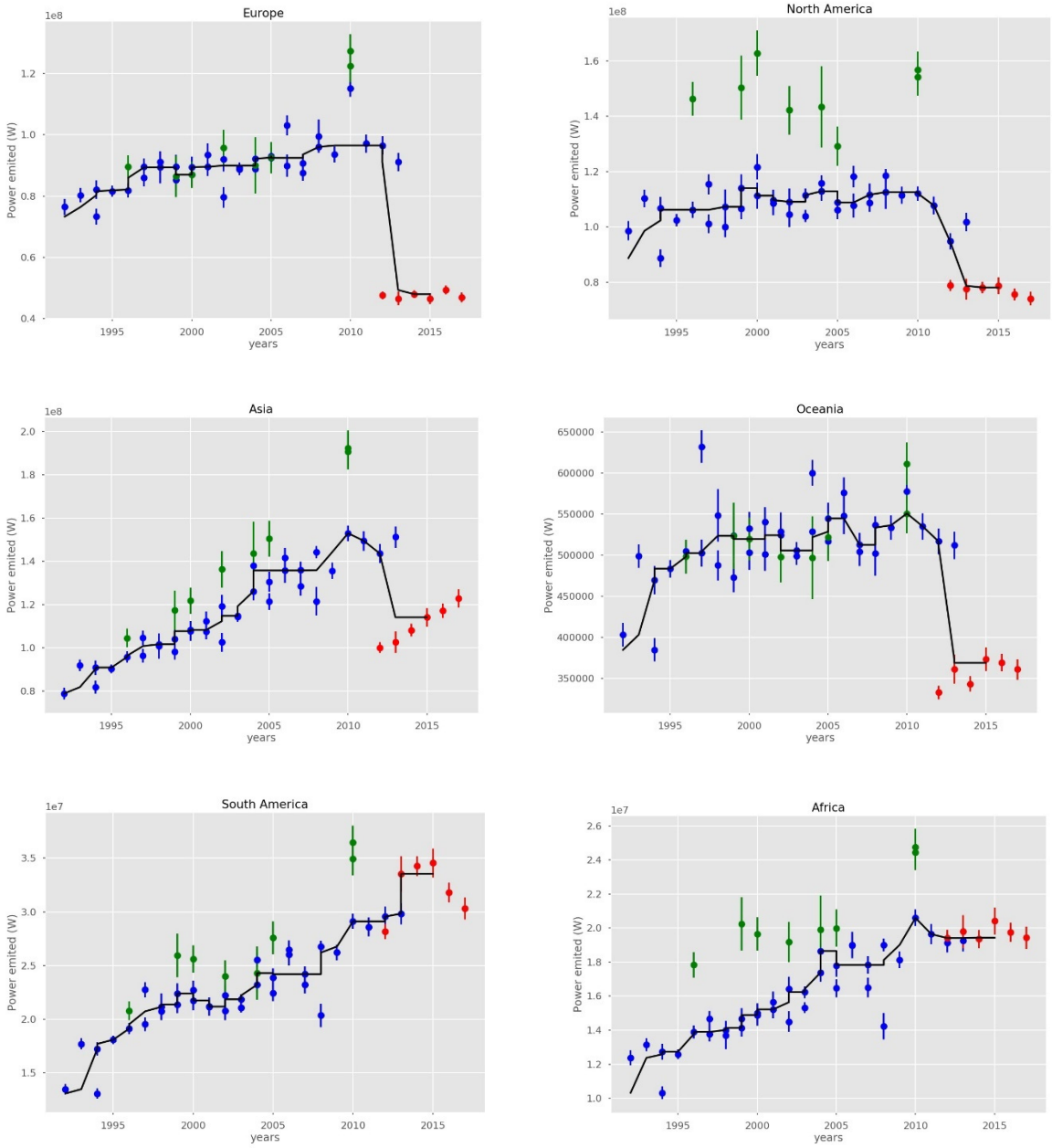
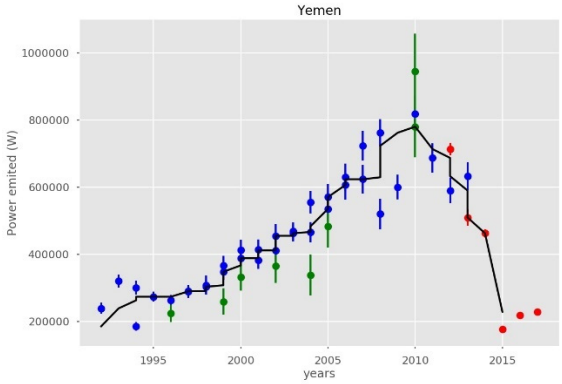
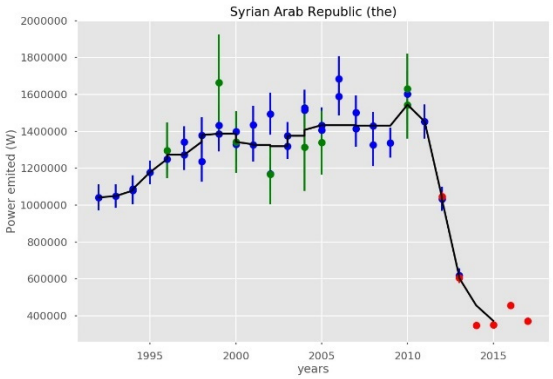
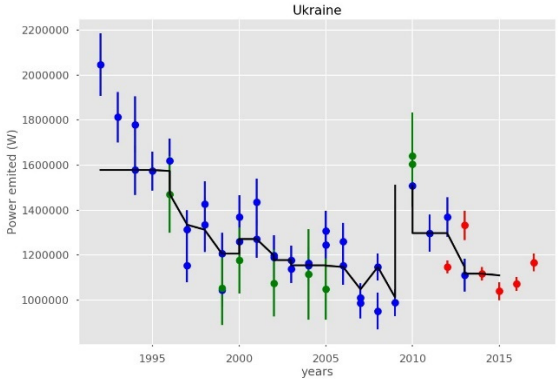
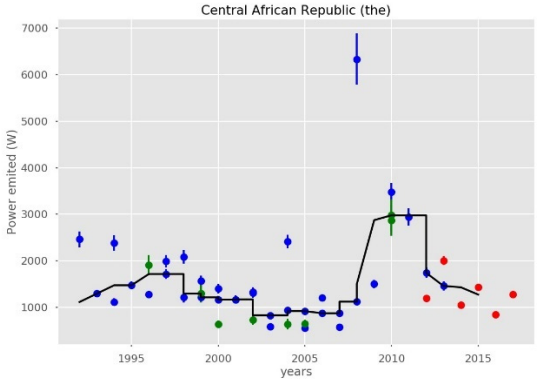


Figure S9. Example of test of the trend of Yemen, Syria, Ukranie and Central Africa. In Blue are the DMSP uncalibrated, in green the DMSP calibrated and in red the VIIRS data.


Yemen
Power emited (W)
1000000
800000
600000
400000
200000
1995
2000
2005
2010
2015
years


Syrian Arab Republic (the)
Power emited (W)
2000000
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
1995
2000
2005
2010
2015
years


Ukraine
Power emited (W)
2200000
2000000
1800000
1600000
1400000
1200000
1000000
1995
2000
2005
2010
2015
years


Central African Republic (the)
Power emited (W)
7000
6000
5000
4000
3000
2000
1000
1995
2000
2005
2010
2015
years