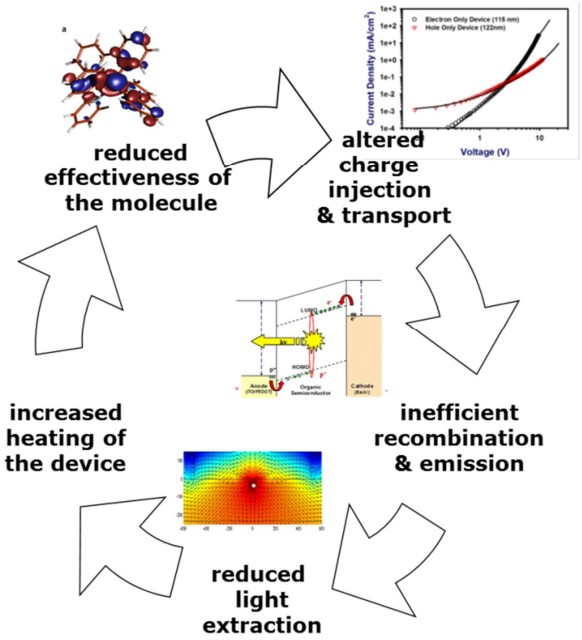
Project Final Report (295368 IM3OLED) - Executive summary

EU FP7 project IM^{3}OLED is a software-focused research project on multi-scale, multi-disciplinary and multi-physics modelling of organic light-emitting diodes. IM^{3}OLED is a collaborative project with experts from the European Union and the Russian Federation. Funded through the European Union's Seventh Framework Programme (FP7-NMP-2011-EU-RUSSIA), the EU portion of the IM³OLED project officially launched in October 2011 and ran for 30 months. The project website can be found at: http://www.im3oled.eu/

Because of their versatility, low energy consumption, lack of hazardous metals and potentially low cost, organic light-emitting diodes (OLEDs) are attractive for application in displays and general lighting. OLEDs are ideally suited to replace existing lighting technologies. in contrast to inorganic LEDs, OLEDs by design are flat and diffuse luminaires. Their unique planar and ultrathin design make it possible for architects and designers to integrate these remarkable lighting devices into structures of any shape and size. For OLEDs to be competitive with existing lighting technologies, however, high efficiencies and lifetimes are crucial. However, improving this requires an integral approach of all variables/processes involved, as these are all interrelated and influencing each other.. Achieving improvements on all involved topics, from chemistry to device physics, by carrying out experiments is possible, but expensive and time-consuming and requires expertise in all disciplines. A predictive simulation tool would significantly simplify this task.



The overall objective of the IM³OLED research project was therefore to find out how OLEDs can become more efficient, by further improving and developing existing and novel models. The project included molecular calculations, electrical and optical simulation, 3D OLED optics and scaling / integration effects.

To achieve our objectives, the IM³OLED project combined partners from Europe and the Russian Federation, including OLED manufacturer Philips and research institute Holst Centre / TNO, modelling partners Fluxim, JCMwave, Kintech Laboratory and leading university groups on the topic of computational physics and multi-scale modelling at the atomistic and molecular length scales (ZHAW, PCC-RAS and MEPhI):

Despite some setbacks, the IM3OLED project has succeeded in researching, developing *and* implementing novel methods in software tools JCMsuite and Setfos. The accomplishments of this project directly impacts the beneficiaries of this project, including the SMEs, but also the industry that make use of their modeling products for OLEDs and other opto-electronic devices.